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Document Name: CABO: One and Two Family Dwelling Code with Errata Package and 1993 Amendments

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Standards Body: Council of American Building Officials



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CABO ONE and TWO FAMILY DWELLING CODE

1993 and 1994 Amendments

**Under the
Nationally Recognized Model Codes**

**BOCA NATIONAL BUILDING CODE
BUILDING OFFICIALS AND CODE ADMINISTRATORS
INTERNATIONAL, INC.**

4051 W. Flossmoor Rd., Country Club Hills, Illinois 60478-5795

**STANDARD BUILDING CODE
SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL, INC.
900 Montclair Road, Birmingham, Alabama 35213-1206**

**UNIFORM BUILDING CODE
INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
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Preface

These are the 1993 and 1994 amendments to the 1992 edition of the Council of American Building Officials (CABO) *One and Two Family Dwelling Code*. These amendments are a result of the 1992 and 1993 Code Change Cycles. The number in the parenthesis prior to each text revision indicates the 1992 or 1993 proposed change from which the revised text is based upon.

New editions of the *One and Two Family Dwelling Code* are published every three years, but revisions are processed annually. Amendments are issued twice between editions with all revisions compiled the third year into a new edition of this code.

The supplement is prepared in a form with permits ready adoption by reference and convenient use.

Chapter 1

Section R-103, page 1. Revise section to read as follows (R1-93):

The provisions of the code apply to the construction, addition prefabrication, alteration, repair, use, occupancy and maintenance of detached one-and two-family dwellings and one-family townhouses not more than three stories in height, and their accessory structures.

Compliance with the requirements of this code may be considered as prima facie evidence of compliance with the locally adopted code.

Section R-104, page 1. Revise section to read as follows (R2-93):

SECTION R-104 - AUTHORITY

R-104.1 General: The building official is hereby authorized and directed to administer and enforce all of the provisions of this code.

R-104.2 Referenced standards: The standards referenced in this code and listed in Chapter 26 shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and referenced standards, the provisions of this code shall apply.

Section R-107, page 2. Delete current section and substitute the following: (R3-93):

R-107.1 General: In order to hear and decide appeals of orders, decisions or determinations made by the building official relative to the application and interpretation of this code, there shall be a Board of Appeals consisting of members who are qualified by experience and training to pass upon matters pertaining to building construction and who are not employees of the jurisdiction. The building official shall act as secretary to the board, but shall have no vote on any matter before the board. The Board of Appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render its decisions and findings in writing to the appellant with a duplicate copy to the building official.

R-107.2 Limitations of Authority: The Board of Appeals shall have no authority relative to interpretations of Part I, the administrative provisions of this code, nor shall the board be empowered to waive requirement of this code.

Section R-109, page 3. Add a new section and renumber existing sections R-109 thru R-118 (R4-93):

SECTION R-109 – MODIFICATIONS

When there are practical difficulties involved in carrying out the provisions of this code, the building official may grant modifications for individual cases. The building official shall first find that a special individual reason makes the strict letter of this code impractical and that the modification is in conformity with the intent and purpose of this code and that such modification does not lessen health, life safety and fire safety requirements. The details of actions granting modifications shall be recorded and entered in the file of the code enforcement agency.

Section R-114, page 5. Revise section to read as follows (R146-93):

SECTION R-114 SWIMMING POOLS, SPAS AND HOT TUBS

Provisions for swimming pools, spas and hot tubs are contained in Appendix F and shall be enforced only when specifically adopted by the jurisdiction.

Section R-116, page 5. Revise section to read as follows (R6-93):

SECTION R-116 EXISTING STRUCTURES

R-116.1 Continuations of existing use: Buildings and structures in existence at the time of the adoption of this code may have their existing use continued if such use was legal at the time of adoption of this code, provided such continued use is not dangerous to life.

R-116.2 Additions, alterations or repairs: Additions, alterations or repairs to any structure shall conform to that required of a new structure without requiring the existing structure to comply with all of the requirements of this code, unless otherwise stated. Additions, alterations or repairs shall not cause an existing structure to become unsafe or adversely affect the performance of the building. Any building plus new additions shall not exceed the height in stories specified for new buildings in Section R-103.

Alterations or repairs to an existing structure which are structural or adversely affect any structural member or any part of the structure having a required fire-resistance rating shall be made with materials required for a new structure.

Section R-118, page 7. Delete definition without substitution (R7-93):
Hot water: (Deleted)

Section R-118, page 7. Revise definitions as follows (R1-92), (R8-93):

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Listed and Listing: Terms referring to equipment which is shown in a list published by an approved testing agency qualified and equipped for experimental testing and maintaining an adequate periodic inspection of current productions and whose listing states that the equipment complies with nationally recognized standards, when installed in accordance with manufacturer's installation instructions.

Story above grade: Any story having its finished floor surface entirely above grade except that a basement shall be considered as a story above grade when the finished surface of the floor above the basement is:

1. More than 6 ft above grade plane;
2. More than 6 ft above the finished ground level for more than 50 percent of the total building perimeter; or
3. More than 12 ft above the finished ground level at any point.

Section R-118, page 6. Add definitions as follows (R66-92, R8-93):

Grade plane: A reference plane representing the average of the finished ground level adjoining the building at all exterior walls.

Wood structural panel: A structural panel product composed primarily of wood, and meeting the requirements of DOC PS 1 or DOC PS 2 listed in Section S-26.118. Wood structural panels include all-veneer plywood, composite panels containing a combination of veneer and wood-based material, and mat-formed panels such as oriented strand board and waferboard.

Chapter 2

Table No. R-201.2, page 9. Revise table to read as follows (R10-93):
Delete footnote #1 and renumber existing footnotes.

Table No. R-201.2
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

ROOF SNOW LOAD (Lbs. per Sq. Ft.)	WIND PRESSURE ³ (Lbs. per Sq. Ft.)	SEISMIC CONDITION BY ZONE	SUBJECT TO DAMAGE FROM ¹		SUBJECT TO DAMAGE FROM ²		WINTER DESIGN ⁴ TEMP. FOR HTG. FACILITIES
			Weathering	Frost Line Depth	Termite	Decay	

Table No. R-201.4, page 10. Add the following uses and live loads to the table and add the following footnote (R4-92 and R9-93):

**Table No. R-201.4
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS**

USE	LIVE LOAD
Stairs	40 ¹
Guardrails and Handrails (A single concentrated load applied in any direction at any point along the top)	200

¹Individual stair treads shall be designed for the uniformly distributed live load or a 300-pound concentrated load acting over an area of 4 square inches, whichever produces the greater stresses.

Section R-201.5, page 10. Add a new section to read as follows and renumber existing sections (R10-93):

R-201.5 Roof load: Roofs shall be designed for the live load indicated in Table No. R-201.5 or the snow load indicated in Table No. R-201.2, whichever is greater.

**Table No. R-201.5
MINIMUM ROOF LIVE LOADS
IN POUNDS-FORCE PER SQUARE FOOT OF
HORIZONTAL PROJECTION**

Roof slope	Tributary loaded area in square ft for any structural member		
	0 to 200	201 to 600	Over 600
Flat or rise less than 4 inches per ft (1:3)	20	16	12
Rise 4 inches per ft (1:3) to less than 12 inches per ft (1:1)	16	14	12
Rise 12 inches per ft (1:1) and greater	12	12	12

Section R-202.1, page 10. Revise section to read as follows (R5-92):

R-202.1 Exterior Walls: Exterior walls located less than 3 ft. from property lines shall have not less than a 1-hour fire-resistive rating. The fire-resistive rating of exterior walls located less than 3 ft. from property line shall be rated for exposure from both sides. Projections beyond the exterior wall shall not extend more than 12 inches into areas where openings are prohibited.

Section R-202.2, page 10. Revise section to read as follows (R6-92):

R-202.2 Openings: Openings shall not be permitted in exterior walls of dwellings located less than 3 ft. from the property line. This distance shall be measured perpendicular to the vertical plane of the wall.

Section R-203.1, page 11. Revise section to read as follows (R7-92):

R-203.1 Habitable Rooms: All habitable rooms shall be provided with aggregate glazing area of not less than 8 percent of the floor area of such rooms. One-half of the required area of glazing shall be openable.

Exceptions:

1. The glazed areas need not be openable where the opening is not required by Section R-210 and an approved mechanical ventilation system is provided capable of producing 0.35 air changes per hour in the room or a whole-house mechanical ventilation system is installed capable of supplying outdoor ventilation air of 15 cubic ft. per minute per occupant computed on the basis of two occupants for the first bedroom and one occupant for each additional bedroom.
2. The glazed areas may be omitted in rooms where the opening is not required by Section R-210 and an approved mechanical ventilation system is provided capable of producing 0.35 air changes per hour in the room or a whole-house mechanical ventilation system is installed capable of supplying outdoor ventilation air of 15 cubic ft. per minute per occupant computed on the basis of two occupants for the first bedroom and one occupant for each additional bedroom, and artificial light is provided capable of producing an average illumination of six footcandles over the area of the room at a height of 30 inches above the floor level.

Section R-206, page 12. Revise section to read as follows (R9-92):

SECTION R-206 —SANITATION

R-206.1 Toilet facilities: Every dwelling unit shall be provided with a water closet, lavatory and a bathtub or shower.

R-206.2 Kitchen: Each dwelling unit shall be provided with a kitchen area and every kitchen area shall be provided with a sink of approved nonabsorbent material.

R-206.3 Sewage disposal: All plumbing fixtures shall be connected to a sanitary sewer or to an approved private sewage disposal system.

R-206.4 Water supply to fixtures: All plumbing fixtures shall be connected to an approved water supply. Kitchen sinks, lavatories, bathtubs, showers, bidets, laundry tubs and washing machine outlets shall be provided with hot and cold water.

Section R-208.4 page 14. Add the following paragraph (R12-93):

R-208.4 Hazardous locations: The following shall be considered specific hazardous locations for the purposes of glazing:

(No change to 1 through 8)

9. Glazing in walls and fences enclosing indoor and outdoor swimming pools where the bottom edge of the pool side is 1) less than 60 inches above a walking surface and 2) within 36 inches horizontally of a walking surface. This shall apply to single glazing and all panes in multiple glazing.

Section R-209.2, page 18. Revise section to read as follows (R15-93):

R-209.2 Separation required: The garage shall be separated from the residence and its attic area by means of 1/2 inch gypsum board or equivalent.

Section R-210.2, page 18. Revise section to read as follows (R14-92 and R15-92, R17-93):

R-210.2 Emergency egress openings: Every sleeping room shall have at least one openable window or exterior door approved for emergency egress or rescue. The units must be operable from the inside to a full clear opening without the use of a key or tool. Where windows are provided as a means of egress or rescue they shall have a sill height of not more than 44 inches above the floor.

Bars, grills, screens or other obstructions placed over emergency escape windows shall be releasable or removable from the inside without the use of a key or tool.

All egress or rescue windows from sleeping rooms must have a net clear opening of 5.7 sq. ft. The minimum net clear opening height shall be 22 inches. The minimum net clear opening width shall be 20 inches.

Exception: Grade floor window may have a minimum net clear opening of five sq. ft.

Section R-210.4, page 18. Add new section to read as follows (R17-92):

R-210.4 Type of lock or latch: All egress doors shall be readily openable from the side from which egress is to be made without the use of a key.

Section R-212, page 18. Revise section to read as follows (R21-93):

A minimum of 3 ft by 3 ft landing shall be required on each side of an egress door. The floor or landing shall not be more than 1 1/2 inches lower than the top of the threshold.

Exceptions:

1. At the top a flight of stairs, provided the door does not swing over the stairs.
2. The landing at the exterior doorway shall not be more than 8 1/4 inches below the top of the threshold, provided the door does not swing over the landing.
3. Exterior storm and screen doors are exempt from the requirements for landings.

Section R-213.1, page 19. Revise section to read as follows (R26-93):

R-213.1 General: When risers are closed, all treads may have a uniform projection not to exceed 1 1/2 inches.

The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch. The greatest tread run within any flight of stairs shall not exceed the smallest by more than 3/8 inch. The walking surface of treads and landings of a stairway shall be sloped no steeper than 1:48.

The radius of curvature at the leading edge of the tread shall be no greater than 9/16 inch. Bevelling of nosings shall not exceed 1/2. Risers shall be vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees from the vertical.

Stairways shall not be less than 3 ft in clear width, and the headroom rise and run shall conform to Figure No. R-213.1. Handrails may project from each side of a stairway a distance of 3 1/2 inches into the required width.

Section R-214.1, page 20. Revise section to read as follows (R30-93, R35-93):

R-214.1 Handrails: Handrails having minimum and maximum heights of 30 inches and 38 inches, respectively, measured vertically from the nosing of the treads, shall be provided on at least one side of stairways of three or more risers. Spiral stairways shall have the required handrail located on the outside radius. All required handrails shall be continuous

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the full length of the stairs. Ends shall be returned or shall terminate in newel posts or safety terminals.

Handrails shall have either a circular cross section with a diameter of not less than 1 1/4 inches to 2 inches, or a noncircular cross section with a perimeter dimension of at least 4 inches but not more than 6 1/4 inches and a largest cross section dimension not exceeding 2 1/4 inches. Edges shall have a minimum radius of 1/8 inch.

Handrails adjacent to a wall shall have a space of not less than 1 1/2 inches between the wall and the handrail.

Section R-214.2, page 20. Revise section to read as follows (R28-92):

R-214.2 Guardrails: Porches, balconies or raised floor surfaces located more than 30 inches above the floor or grade below shall have guardrails not less than 36 inches in height.

Open sides of stairs with a total rise of more than 30 inches above the floor or grade below shall have guardrails not less than 34 inches in height measured vertically from the nosing of the treads.

Required guardrails on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures which do not allow passage of an object 4 inches or more in diameter.

Exception: The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway may be of such a size that a sphere 6 inches cannot pass through.

Section R-215.1, page 20. Revise first paragraph to read as follows: (R39-93):

R-215.1 Smoke detectors required: Smoke detectors shall be installed in each sleeping room, outside of each separate sleeping area in the immediate vicinity of the bedrooms and on each additional story of the dwelling, including basements and cellars but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels, a smoke detector need be installed only on the upper level, provided the lower level is less than one full story below the upper level, except that if there is a door between levels, then a detector is required on each level. All detectors shall be interconnected such that the actuation of one alarm will actuate all the alarms in the individual unit and shall provide an alarm which will be audible in all sleeping areas. All detectors shall be approved and listed and shall be installed in accordance with the manufacturer's instructions.

Section R-216.2.2, page 21. Revise section to read as follows (R30-92):

R-216.2.2 Roofing: Foam plastic may be used in a roof-covering assembly without the thermal barrier when the foam is separated from

the interior of the building by plywood or wood structural panel sheathing in accordance with Section R-703, not less than 15/32 inch in thickness bonded with exterior glue and identified as Exposure 1, with edge supported by blocking, tongue-and-groove joints other approved type of edge support, or an equivalent material. Foam plastic roof insulation which complies with FM 4450 or UL 1256, listed in Section S-26.216, need not meet the requirements of Section R-216.1 for all roof applications. The smoke-developed rating shall not be limited.

Section R-216.2.3, page 22. Revise section to read as follows (R31-92):

R-216.2.3 Attics and crawl spaces: Within an attic or crawl space where entry is made only for service of utilities, foam plastics shall be protected against ignition by 1½-inch-thick mineral fiber insulation, ¼-inch-thick wood structural panels, ¾-inch particleboard, ¼-inch hardboard, or ¾-inch gypsum wallboard, corrosion-resistant steel having a base metal thickness of 0.016 inch, or other approved material installed in such a manner that the foam plastic is not exposed. The protective covering shall be consistent with the requirements for the type of construction.

Section R-217.2, page 23. Revise section to read as follows. Renumber existing sections R-218 through R-220 (R40-93 and R42-93):

SECTION R-218 - INSULATION

R-218.1 Insulation: All exposed insulation materials, including facings, such as vapor barriers or breather papers installed within floor-ceiling assemblies, roof-ceiling assemblies, wall assemblies, crawl spaces and attics shall have a flame-spread rating not to exceed 25 with an accompanying smoke developed factor not to exceed 450 when tested in accordance with ASTM E 84 listed in Section S-26.218.

Exception: When such materials are installed in concealed spaces, the flame-spread and smoke-development limitations do not apply to the facings, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.

R-218.2 Loose-fill Insulation: Loose-fill insulation materials which cannot be mounted in the ASTM E 84 apparatus without a screen or artificial supports shall have a flame-spread rating not to exceed 25 with an accompanying smoke developed factor not to exceed 450 when tested in accordance with CAN4-S102.2-M83 listed in Section S-26.218.

R-218.3 Exposed Attic Insulation: All exposed insulation materials installed on attic floors shall have a critical radiant flux not less than 0.12 watts per square centimeter.

R-218.4 Testing: Tests for critical radiant flux shall be made in accordance with ASTM E 970 listed in Section S-26.218.

Section R-218.1, page 23. Add new section to read as follows (R43-93):

R-218.1.1 Supporting construction: When floor assemblies are required to be fire-resistive rated by section R-218.1, the supporting construction of such assemblies shall have an equal or greater fire-resistive rating.

Section R-218.2.2, page 24. Revise Exception to item 2 to read as follows (R32-92):

Exception: A parapet is not required in the two cases above when the roof is covered with a minimum C roof covering, and the roof decking or sheathing is of noncombustible materials or approved fire-retardant-treated wood for a distance of 4 feet on each side of the wall, or one layer of 5/8-inch type X gypsum board is installed directly beneath the roof decking or sheathing for a distance of 4 feet on each side of the wall.

Section R-219, page 24. Change Section R-219 to R-213 and renumber existing R-213 through R-219.

Chapter 3

Section R-301.3, page 27. Revise section to read as follows (R35-92):

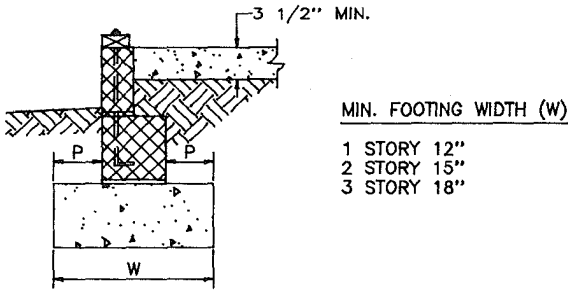
R-301.3 Drainage: Lots shall be provided with adequate drainage and shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6 inches within the first 10 ft.

Exception: Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches of fall within 10 ft., then drains, swales, or other approved means shall be provided to ensure positive drainage.

Section R-302.2, page 28. Revise section to read as follows (R46-93):

R-302.2 Concrete: Concrete shall have a minimum specified compressive strength as shown in Table R-302.2. Concrete subject to weathering as indicated in Table No. R-201.2 shall be air entrained as specified in Table No. R-302.2. The minimum cement content of concrete mixtures for exterior porches, carport slabs, and steps that will be exposed to freezing and thawing in the presence of deicing chemicals shall be 520 lb of cement meeting ASTM C 150 or C 595, per cubic yard of concrete.

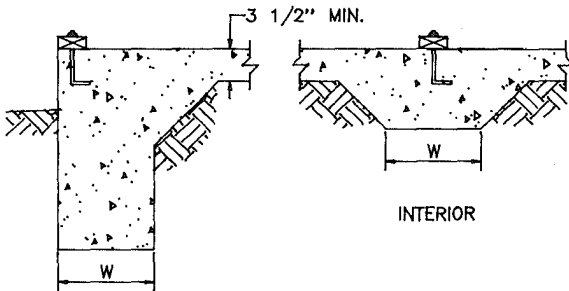
Figure No. R-303, Page 30. Delete current figure and substitute the following (R37-92):



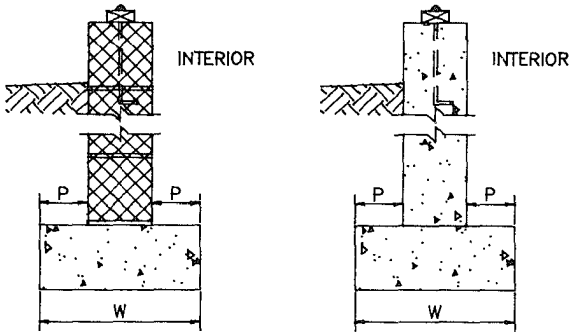
GROUND SUPPORT SLAB
WITH MASONRY STEM WALL

MIN. FOOTING WIDTH (W)

- 1 STORY 12"
- 2 STORY 15"
- 3 STORY 18"



MONOLITHIC SLAB/FOOTING



BASEMENT OR CRAWLSPACE
WITH MASONRY WALL

BASEMENT OR CRAWLSPACE
WITH CONCRETE WALL

Figure No. R-303 Notes:

1. Exterior footings shall extend to below the frost line unless otherwise protected against frost heave. In no case shall exterior footings be less than 12 inches below grade.
2. Footing widths (W) are based on soil with an allowable soil pressure of 2000 pounds per sq. ft. Footings on soil with a lower allowable soil pressure shall be designed in accordance with accepted engineering practice.
3. Footings shall be a minimum of 6 inches thick. Footing projections (P) shall not exceed the footing thickness.
4. Footings shall be supported on undisturbed natural soil or engineered fill.
5. The sill plate or floor system shall be connected with 1/2 inch diameter bolts placed six ft. on center and not more than 12 inches from corners or approved equivalent. Bolts shall extend a minimum of 15 inches into masonry or seven inches into concrete. Sill plates shall be protected against decay where required by section R-308.1.
6. Pier and column footing sizes shall be based on the tributary load and allowable soil pressure in accordance with Table No. R-602.2.1b.

Section R-304.1, page 29. Revise section to read as follows (R49-93 and R50-93):

R-304.1 Concrete and masonry: Foundation walls shall be constructed in accordance with the provisions of this section or in accordance with ACI 318, ACI 318.1, or NCMA TR68-A, or ACI 530/ASCE 5/TMS 402 except Appendix A, listed in Section S-26.304 or other approved structural systems.

Exception: When ACI 530/ASCE 5/TMS 402 is used to design masonry foundation walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design.

Section R-304.2, page 29. Revise section to read as follows (R40-92 and R51-93):

R-304.2 Backfill damage: Foundation walls shall extend at least 6 inches above the finished grade adjacent to the foundation at all points.

Exception: Where masonry veneer is used, foundation walls shall extend a minimum of 4 inches above the finished grade.

Backfill adjacent to the wall shall not be placed until the wall has sufficient strength and has been anchored to the floor, or has been sufficiently braced to prevent damage by the backfill.

Section R-304.3, page 29. Revise section to read as follows (R41-92):

R-304.3 Masonry or concrete foundation walls: Masonry and concrete foundation walls shall be constructed using the following criteria:

1. Masonry or concrete foundation walls located in Seismic Zone 0, 1, or 2, as established in Table No. R-201.2, shall be constructed as set forth in Table No. R-304.3a.

Exception: Where unstable soil conditions exist or where the foundation extends to or below the seasonal high groundwater table, foundation walls shall be constructed in accordance with Table No. R-304.3b.

2. Masonry or concrete foundation walls located in Seismic Zone 3 or 4 as established in Table No. R-202.2 shall be constructed as set forth in Table No. R-304.3b.

Table No. R-304.3a, page 31. Revise table as follows (R54-93):

FOUNDATION WALL CONSTRUCTION	NOMINAL THICKNESS, INCHES	MAXIMUM UNBALANCED FILL, FEET
Rubble Stone Masonry	16	8

Section R-304.5, page 32. Revise second paragraph to read as follows (R42-92):

All load-bearing lumber and plywood shall conform to applicable standards or grading rules and be identified by a grade mark or certificate of inspection issued by an approved lumber or plywood grading or inspection bureau or agency. Lumber shall conform to DOC PS20-70.

Table R-304.5, page 35. Revise footnote #3 to read as follows (R43-92):

³Plywood shall be of the following minimum grades in accordance with DOC PS 1 or DOC PS 2 listed in Section S-26.304:

- (i) DOC PS 1 Plywood grades marked:
 - A. Structural I C-D (Exposure 1)
 - B. C-D (Exposure 1)
- (ii) DOC PS 2 Plywood grades marked:
 - A. Structural I C-D Sheathing (Exposure 1)
 - B. Sheathing (Exposure 1)
- (iii) Where a major portion of the wall is exposed above ground and a better appearance is desired, the following plywood grades marked Exterior are suitable:
 - A. Structural I A-C, Structural I B-C or Structural I C-C (Plugged) in accordance with DOC PS 1

- B. A-C Group 1, B-C Group 1, C-C (Plugged) Group 1 or MDO Group 1 in accordance with DOC PS 1
- C. Single Floor in accordance with DOC PS 2

Section R-306, pages 38-39. Delete R-306.1 and substitute the following: Renumber existing R-306.2 (R44-92):

SECTION R-306 - FOUNDATION WATERPROOFING AND DAMPPROOFING

R-306.1 Concrete and Masonry Foundation Dampproofing: Except where required to be waterproofed by Section R-306.2, foundation walls enclosing habitable or storage space shall be dampproofed from the top of the footing to finished grade. Masonry walls shall be dampproofed by applying not less than $\frac{3}{8}$ inch portland cement parging to the exterior of the wall. The parging shall be covered with a bituminous coating or other approved dampproofing material. Concrete walls shall be dampproofed by applying an approved dampproofing material to the exterior of the wall.

R-306.2 Concrete and Masonry Foundation Waterproofing: In areas where a high water table or other severe soil-water conditions are known to exist, exterior foundation walls enclosing habitable or storage space shall be waterproofed with a membrane extending from the top of the footing to the finished grade. The membrane shall consist of 2 ply hot-mopped felts, 55 pound roll roofing, 6-mil poly vinyl chloride, 6-mil polyethylene or other approved materials. The joints in the membrane shall be lapped and sealed with an approved adhesive compatible with the waterproofing membrane.

Section R-308.1, page 40. Revise section to read as follows (R45-92):

R-308.1 Protection: Wood columns shall be protected against decay as set forth in Section R-221.

All surfaces (inside and outside) of steel columns shall be given a shop coat of rust-inhibitive paint or the equivalent, except for corrosion-resistant steel and steel treated with coatings to provide corrosion resistance.

Sections R-309 and R-310, pages 40-42. Change Section R-309 to R-221 and revise to read as follows (R45-92); Change Section R-310 to R-222 (R46-92); Renumber R-311 to R-309:

SECTION R-221 - PROTECTION AGAINST DECAY

R-221.1 Location required: In areas subject to decay damage as established by Table No. R-201.2, the following locations shall require the use of an approved species and grade of lumber, pressure preservatively treated in accordance with AWWA C1, C2, C3, C4, C9,

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C15, C18, C20 C22, C23, C24, C27, C28, P1, P2, and P3 listed in Section S-26.221, or decay-resistant heartwood of redwood, black locust, or cedars.

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches or wood girders when closer than 12 inches to exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.
2. All sills or plates which rest on concrete or masonry exterior walls and are less than 8 inches from exposed ground.
3. Sills and sleepers on a concrete or masonry slab which is in direct contact with the ground unless separated from such slab by an impervious moisture barrier.
4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than $\frac{1}{2}$ inch on tops, sides, and ends.
5. Wood siding, sheathing and wall framing on the exterior of a building having a clearance of less than 6 inches from the ground.
6. Wood structural members supporting moisture-permeable floors or roofs which are exposed to the weather, such as concrete or masonry slabs, unless separated from such floors or roofs by an impervious moisture barrier.
7. Wood furring strips or other wood framing members attached directly to the interior of exterior masonry walls or concrete walls below grade except where an approved vapor retarder is applied between the wall and the furring strips or framing members.

All wood in contact with the ground and which supports permanent structures intended for human occupancy shall be approved wood suitable for ground contact use, except untreated wood may be used where entirely below ground-water level or continuously submerged in fresh water.

In geographical areas where experience has demonstrated a specific need, approved naturally durable or pressure-treated wood shall be used for those portions of wood members which form the structural supports of buildings, balconies, porches, or similar permanent building appurtenances when such members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering which would prevent moisture or water accumulation on the surface or at joints between members. Depending on local experience, such members may include:

1. Horizontal members such as girders, joists and decking.
2. Vertical members such as posts, poles and columns.

3. Both horizontal and vertical members.

Posts, poles, and columns supporting permanent structures intended for human occupancy which are embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather shall be approved pressure-treated wood suitable for ground contact use.

Wood columns shall be approved wood of natural decay resistance or approved pressure preservatively treated wood.

Exception: Posts or columns supported by piers projecting 2 inches above the floor or finish grade and separated therefrom by an approved impervious moisture barrier.

R-221.2 Quality of material: Lumber and plywood required to be pressure preservatively treated in accordance with this code shall bear the quality mark of an approved inspection agency which maintains continuing supervision, testing and inspection over the quality of the product.

The required quality mark on each piece of pressure preservatively treated lumber or plywood shall contain the following information:

1. Identification of the treating plant.
2. Year treated.
3. Type of preservative.
4. The minimum preservative retention.
5. End use for which product was treated.
6. Standard to which product was treated.
7. Identity of the approved inspection agency.
8. The designation "Dry," if applicable.

Exception: When lumber 1 inch or less in thickness and 4 inches or less in width, or 36 inches or less in length, has been bundled, one mark is required on the face of those pieces which form the exterior surfaces of the bundle.

R-221.3 Fasteners: Fasteners for pressure preservative and fire retardant treated wood shall be of hot-dipped zinc-coated galvanized stainless steel, silicon bronze, or copper. Fasteners for treated wood foundations shall be as required in NFoPA Technical Report No. 7 listed in Section S-26.221.

Section R-222 - Protection Against Termites

R-222.1 Subterranean termite control: In areas favorable to termite damage as established by Table No. R-201.2, methods of protection shall be by chemical soil treatment, pressure-treated wood, naturally termite-resistant wood or physical barriers approved by the building official. Approved combinations of methods may be used.

R-222.2 Chemical soil treatment: The concentration, rate of application and treatment method of the termiticide shall be consistent

with and never less than the termiticide label and applied according to recommendations of the USDA Forest Service as cited in Home and Garden Bulletin No. 64, listed in Section S-26.222.

R-222.3 Pressure-treated and naturally resistant wood: Heartwood of redwood and eastern red cedar shall be considered termite resistant. Pressure-treated wood and naturally termite-resistant wood shall not be used as a physical barrier unless a barrier can be inspected for any termite shelter tubes around the inside and outside edges and joints of a barrier.

Field cut ends, notches and drilled holes of pressure-treated wood shall be retreated in the field according to AWPAC M4 listed in Section S-26.222.

Section R-311.1, pages 42-43. Add Exception #5 to read as follows (R48-92):

5. Ventilation openings may be omitted when continuously operated mechanical ventilation is provided at a rate of 1.0 cfm for each 50 sq. ft. of crawl space floor area and ground surface is covered with an approved vapor barrier material.

Section R-311.3, page 43. Revise section to read as follows (R47-92):

R-311.3 Removal of debris: The under-floor grade shall be cleaned of all vegetation and organic material. All wood forms used for placing concrete shall be removed before a building is occupied or used for any purpose. All construction materials shall be removed before a building is occupied or used for any purpose.

Chapters 4, 5, 6 pages 45 thru 103. Reorder chapters as follows and renumber sections accordingly (R56-93):

Chapter 4 - FLOORS

Chapter 5 - WALL CONSTRUCTION

Chapter 6 - WALL COVERING

Chapter 4

Section R-402.1, page 45. Revise section to read as follows (R49-92):

R-402.1 Identification: Load bearing dimension lumber for studs, plates and headers shall conform to DOC PS20-70 and to other applicable standards and grading rules and shall be identified by a grade mark, or certificate of inspection issued by an approved agency. The grade mark or certificate shall provide adequate information to determine the "F_b," the allowable stress in bending, and "E," the modulus of elasticity. Approved end-jointed lumber may be used

interchangeably with solid-sawn members of the same species and grade.

Section R-402.3, page 45. Revise first paragraph to read as follows (R57-93):

R-402.3 Construction: Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figure Nos. R-402.3a and R-402.3b, or in accordance with the NFoPA “National Design Specification for Wood Construction” listed in Section S-26.402. Components of exterior walls shall be fastened in accordance with Table No. R-402.3.

Table No. R-402.3a, pages 47 and 48. Revise table to read as follows, revise footnotes 5 and 7 (R50-92, R51-92, R59-93, R60-93, R61-93, R62-93):

One and Two Family Dwelling Code
Table No. R-402.3a
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

DESCRIPTION OF BUILDING ELEMENTS	NUMBER & TYPE OF FASTENER ^{2,3,5}	SPACING OF FASTENERS
Joist to sill or girder, toe nailed	3-8d	—
1" x 6" subfloor or less to each joist, face nail	2-8d 2 staples, 1 3/4"	— —
2" subfloor to joist or girder, blind and face nail	2-16d	—
Sole plate to joist or blocking, face nail	16d	16" o.c.
Top or sole plate to stud, end nail	2-16d	—
Stud to sole plate, toe nail	3-8d or 2-16d	—
Double studs, face nail	10d	24" o.c.
Double top plates, face nail	10d	24" o.c.
Top plates, laps and intersections, face nail	2-10d	—
Built-up header, two pieces with 1/2" spacer	16d	16" o.c. along each edge
Continued header, two pieces	16d	16" o.c. along each edge
Ceiling joists to plate, toe nail	3-8d	—
Continuous header to stud, toe nail	4-8d	—
Ceiling joist, laps over partitions, face nail	3-10d	—
Ceiling joist to parallel rafters, face nail	3-10d	—
Rafter to plate, toe nail	2-16d	—
1" brace to each stud and plate, face nail	2-8d 2 staples, 1 3/4"	— —
1" x 6" sheathing to each bearing, face nail	2-8d 2 staples, 1 3/4"	— —
1" x 8" sheathing to each bearing, face nail	2-8d 3 staples, 1 3/4"	— —
Wider than 1" x 8" sheathing to each bearing, face nail	3-8d 4 staples, 1 3/4"	— —
Built-up corner studs	10d	24" o.c.
Built-up girders and beams, 2 inch lumber layers	10d	Nail each layer as follows: 32" o.c. at top and bottom, and staggered. Two nails at ends and at each splice.
2" planks	2-16d	At each bearing
Roof rafters to ridge, valley or hip rafters: toe nail	4-16d	—
face nail	3-16d	—
Rafter ties to rafters, face nail	3-8d	—

Table No. R-402.3a
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS
 (continued)

DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER ^{2,3,5}	SPACING OF FASTENERS	
		Edges	Intermediate Supports ⁴
Plywood, wood structural panels and particleboard, subfloor, roof and wall sheathing to framing			
5/16" - 1/2"	6d	6"	12"
19/32" - 1"	8d	6"	12"
1 1/8" - 1 1/4"	10d smooth or 8d deformed	6"	12"
Other wall sheathing ⁷			
1/2" gypsum sheathing	1 1/2" galvanized roofing nail; 6d common nail; Staple galvanized, 1 1/2" long; 1 1/4" screws, Type W or S	4"	8"
5/8" gypsum sheathing	1 3/4" galvanized roofing nail; 8d common nail; Staple galvanized, 1 5/8" long; 1 5/8" screws, Type W or S	4"	8"
Plywood, wood structural panels and particleboard, combination subfloor-underlayment to framing			
3/4" and less	6d deformed or 8d smooth	6"	12"
7/8" - 1"	8d smooth or deformed	6"	12"
1 1/8" - 1 1/4"	10d smooth or 8d deformed	6"	12"

(No changes to notes 1 thru 4)

⁵Spacing of fasteners not included in this table shall be based on Table No. R-402.3a(1).

(No change to Note 6)

⁷Gypsum sheathing shall conform to ASTM C79 and be installed in accordance with GA 253 listed in Section S-26.402. Fiberboard sheathing shall conform to AHA 194.1, ASTM D2277, and ASTM C208 listed in Section S-26.402. Other sheathing materials shall be approved by the building official.

One and Two Family Dwelling Code

Table R-402.3a (1), page 49. Revise first subheading to read as follows (R52-92):

Plywood, Wood Structural Panels or Particleboard Subfloor, Roof and Wall Sheathing to Framing.

And delete existing floor underlayment portion of the table and replace with the following (R63-93):

NOMINAL MATERIAL THICKNESS	DESCRIPTION OF FASTENER ^{1,2} AND LENGTH	SPACING ³ OF FASTENER	
		Edges	Body of Panel ⁴
Floor Underlayment; Plywood - Hardboard - Particleboard			
Plywood 1/4" & 5/16"	1 1/4" ring or screw shank nail - minimum 12-1/2 ga. (0.099") shank diameter	6"	8"
11/32", 3/8" 15/32" & 1/2"	1 1/4" ring or screw shank nail - minimum 12-1/2 ga. (0.099") shank diameter	6"	8" ⁵
19/32", 5/8" 23/32" & 3/4"	1 1/2" ring or screw shank nail - minimum 12-1/2 ga. (0.099") shank diameter	6"	12"
Hardboard 0.200"	1 1/2" long ring-grooved underlayment nail	6"	6"
	4d cement-coated sinker nail	6"	6"
	Staple 18 ga. 7/8" long (plastic coated)	3"	6"
Particleboard 1/4"	4d ring-grooved underlayment nail	3"	6"
	Staple 18 ga., 7/8" long, 3/16" crown	3"	6"
3/8"	6d ring-grooved underlayment nail	6"	10"
	Staple 16 ga., 1 1/8" long, 3/8" crown	3"	6"
1/2" - 5/8"	6d ring-grooved underlayment nail	6"	10"
	Staple 16 ga., 1 5/8" long, 3/8" crown	3"	6"

(No changes to notes 1-3)

⁴Fasteners shall be placed in a grid pattern throughout the body of the panel.

⁵For 5-ply panels, intermediate nails shall be spaced not more than 12" o.c. each way.

Table R-402.3b, page 50. Delete current table and substitute the following (R54-92):

Table No. R-402.3b
ALLOWABLE STUD SPACING FOR
WOOD STRUCTURAL PANEL WALL SHEATHING

PANEL SPAN RATING	PANEL NOMINAL THICKNESS (Inch)	MAXIMUM STUD SPACING (Inches)	
		SIDING NAILED TO: ¹	
		STUD	SHEATHING
12/0, 16/0, 20/0, or Wall - 16 oc	5/16, 3/8	16	16 ²
24/0, 24/16, 32/16 or Wall - 24 oc	3/8, 7/16, 15/32, 1/2	24	24 ³

¹Blocking of horizontal joints shall not be required.

²Plywood sheathing 3/8-inch thick or less shall be applied with long dimension across studs.

³3-Ply plywood panels shall be applied with long dimension across studs.

Section R-402.6, page 53. Revise section to read as follows (R55-92):

R-402.6 Headers: The allowable spans for nominal 4-inch single headers and 2-inch double headers in bearing walls shall not exceed the spans set forth in Table Nos. R-402.6a through R-402.6f. The tables are not to be used where concentrated loads are supported by the headers.

Nominal 2-inch single headers may be used to span openings in load-bearing walls, provided the headers are of adequate size to support all imposed loads.

Nailed-only plywood-box headers shall be designed in accordance with the NAHB "Construction Guide, Design Tables and Technical Report for Plywood Headers for Residential Construction," listed in Section S-26.402, or by approved engineering practice. Plywood used for beam webs shall be in accordance with DOC PS 1 or DOC PS 2 listed in Section S-26.402.

Load-bearing headers are not required in interior or exterior nonbearing walls. A single flat 2-inch by 4-inch member may be used as a header in exterior nonbearing walls for openings up to 8 feet in width if the vertical distance to the parallel nailing surface above is not more than 24 inches. For such nonbearing headers, no cripples or blocking are required above the header.

Section R-402.7, page 53. Revise section to read as follows (R59-92):

R-402.7 Firestopping: Firestopping shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the

roof space. Firestopping shall be provided in wood-frame construction in the following locations:

1. In concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor level;
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings, cove ceilings, etc.;
3. In concealed spaces between stair stringers at the top and bottom of the run;
4. At openings around vents, pipes, ducts, chimneys and fireplaces at ceiling and floor level, with noncombustible materials.

Except as provided in Item 4 above, firestopping shall consist of 2-inch nominal lumber, or two thicknesses of 1-inch nominal lumber with broken lap joints, or one thickness of $2\frac{3}{32}$ -inch wood structural panels with joints backed by $2\frac{3}{32}$ -inch wood structural panels or one thickness of $\frac{3}{4}$ -inch Type 2-M particleboard with joints backed by $\frac{3}{4}$ -inch Type 2-M particleboard, or other approved materials.

The integrity of all firestops shall be maintained.

Section R-402.8, page 58.2. Revise section to read as follows (R60-92, R67-93):

R-602.10 Draftstopping: When there is useable space above and below the concealed space of a floor/ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed 1,000 sq ft. Draftstopping shall divide the concealed space into approximately equal areas. Draftstopping shall be provided in floor/ceiling assemblies under the following circumstances:

1. Ceiling is suspended under the floor framing; or
2. Floor framing is constructed of truss-type open-web or perforated members.
3. The assembly is enclosed by a floor membrane above and a ceiling membrane below.

Draftstopping materials shall be not less than $\frac{1}{2}$ inch gypsum board, $\frac{3}{8}$ inch wood structural panels, $\frac{3}{8}$ inch Type 2-M-W particleboard, or other approved materials adequately supported. Draftstopping shall be installed parallel to the floor framing members unless otherwise approved by the building official.

The integrity of all draftstops shall be maintained.

Section R-402.9, page 58.2. Revise section to read as follows (R61-92):

R-402.9 Cripple walls: Foundation cripple walls shall be framed of studs not less in size than the studding above with a minimum length of 14 inches, or shall be framed of solid blocking. When exceeding 4 feet

in height, such walls shall be framed of studs having the size required for an additional story.

Such walls having a stud height exceeding 14 inches shall be considered to be first story walls for the purpose of determining the bracing required by Section R-402.10. Solid blocking may be used to brace cripple walls having a stud height of 14 inches or less.

In lieu of solid blocking, stud walls less than 14 inches in height may be sheathed with plywood, or wood structural panels, attached to both the top and bottom plates in accordance with Section R-413.

Section R-402.10, page 58.2. Revise section to read as follows (R62-92, R68-93):

R-402.10 Wall bracing: Exterior and foundation wall panels of frame construction shall be braced with 1 inch by 4 inch let-in braces, or approved metal strap devices installed in accordance with the manufacturer's specifications; wood structural panels in accordance with Table No. R-402.3b; particleboard in accordance with Table No. R-402.3c, gypsum sheathing, wallboard or veneer base applied vertically or horizontally to studs spaced not more than 24 inches on center and fastened in accordance with Table No. R-402.3a; fiberboard sheathing applied vertically to studs spaced not more than 16 inches on center and fastened in accordance with Table No. R-402.3a; portland cement plaster applied over metal lath attached to studs spaced not more than 16 inches on center in accordance with Section R-503.2, or other approved material. If let-in bracing is used, it shall be let into the top and bottom plates and the intervening studs, placed at not more than 60° nor less than 45° from the horizontal and attached to the framing in conformance with Table No. 402.3a. Structural sheathing and 1 inch by 4 inch let-in braces shall be installed in accordance with Table No. R-402.10 and fastened in accordance with Table No. R-402.3a.

Section R-403, page 59. Delete section and substitute the following (R63-92):

SECTION R-403—METAL

R-403.1 General: Elements shall be straight and free of any defects which would significantly affect structural performance.

R-403.2 Steel elements: Structural steel elements shall be designed and constructed in accordance with the AISC-ASD or AISC-LRFD specification listed in Section S-26.403. Cold-formed steel structural elements shall be designed and constructed in accordance with the AISI-ASD or AISI-LRFD specifications listed in Section S-26.403.

R-403.3 Aluminum elements: Aluminum structural elements shall be constructed of materials and designed in accordance with AA SAS30 listed in Section S-26.403.

Section R-404, pages 59-69. Revise section to read as follows, delete sections 404.3.1 and 404.3.2 without substitution. Renumber Table No. R 404.3.1 to Table No. R-404.4 and delete Figure No. R-404.9 and substitute as follows (R64-92, R65-92, R69-93, R70-93, R72-93 R73-93):

R-404.1 General: Masonry construction shall be designed and constructed in accordance with the provisions of this section or in accordance with the provisions of ACI 530/ASCE 5/ TMS 402 listed in Section S-26.404.

When the empirical design provisions of National Masonry Standard Chapter 9 or the provisions of this section are used to design masonry, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design.

R-404.2 Thickness of masonry: (No change to existing section)

R-404.2.1 Minimum thickness: The minimum thickness of masonry bearing walls more than one story high shall be 8 inches. Solid masonry walls of one story dwellings and garages shall not be less than 6 inches in thickness when not greater than 9 ft in height, provided that when gable construction is used, an additional 6 ft is permitted to the peak of the gable. Masonry walls shall be laterally supported in either the horizontal or vertical direction at intervals as required by Section R-404.8.

R-404.2.2 Rubble stone masonry wall: The minimum thickness of rough or random or coursed rubble stone masonry walls shall be 16 inches.

R-404.2.3 Change in thickness: (No change to existing section)

R-404.2.4 Parapet walls: (No change to existing section)

R-404.3 Corbeled masonry: (No change to existing section)

Table No. R-404.4 Allowable Compressive Stresses For Empirical Design of Masonry (No change to remainder of table).

R-404.4 Allowable stresses: Allowable compressive stresses in masonry shall not exceed the values prescribed in Table No. R-404.4. In determining the stresses in masonry, the effects of all loads and conditions of loading and the influence of all forces affecting the design and strength of the several parts shall be taken into account.

R-404.4.1 Combined units: (No change to existing section)

R-404.5 Piers: (No change to existing section)

R-404.6 Chases: Chases and recesses in masonry walls shall not be deeper than $\frac{1}{3}$ the wall thickness, and the maximum length of a horizontal chase or horizontal projection shall not exceed 4 ft, and shall have at least 8 inches of masonry in back of the chases and recesses and between adjacent chases or recesses and the jambs of openings. Chases and recesses in masonry walls shall be designed and constructed so as not to reduce the required strength or required fire resistance of the wall and in no case shall a chase or recess be permitted within the required area of a pier. Masonry directly above chases or recesses wider than 12 inches shall be supported on noncombustible lintels.

R-404.7 Stack Bond: (No change to existing section)

R-404.8 Lateral support: Masonry walls shall be laterally supported in either the horizontal or the vertical direction. The maximum spacing between lateral supports shall not exceed the distances in Table R-404.8. Lateral support shall be provided by cross walls, pilasters, buttresses, or structural frame members when the limiting distance is taken horizontally, or by floors or roofs when the limiting distance is taken vertically.

Table No. R-404.8
SPACING OF LATERAL SUPPORT FOR MASONRY WALLS

Construction	Maximum Wall Length to Thickness or Wall Height to Thickness ^{1,2}
Bearing walls	
Solid or solid grouted	20
All other	18
Nonbearing walls	
Exterior	18
Interior	36

¹Except for cavity walls and cantilevered walls, the thickness of a wall shall be its nominal thickness measured perpendicular to the face of the wall. For cavity walls, the thickness shall be determined as the sum of the nominal thicknesses of the individual wythes. For cantilever walls, except for parapets, the ratio of height to nominal thickness shall not exceed 6 for solid masonry, or 4 for hollow masonry. For parapets, see Section R-404.2.4.

²An additional unsupported height of 6 feet is permitted for gable end walls.

R-404.8.1 Horizontal lateral support: Lateral support in the horizontal direction provided by intersecting masonry walls shall be provided by one of the methods in Sections R-404.8.1.1 or R-404.8.1.2.

R-404.8.1.1 Bonding pattern: Fifty percent of the units at the intersection shall be laid in an overlapping masonry bonding pattern,

with alternate units having a bearing of not less than 3 inches on the unit below.

R-404.8.1.2 Metal reinforcement: Interior nonloadbearing walls shall be anchored at their intersections, at vertical intervals of not more than 16 inches with joint reinforcement of at least 9 gage, or 1/4 inch galvanized mesh hardware cloth. Intersecting masonry walls, other than interior nonloadbearing walls, shall be anchored at vertical intervals of not more than 8 inches with joint reinforcement of at least 9 gage and shall extend at least 30 inches in each direction at the intersection. Other metal ties, joint reinforcement or anchors, if used, shall be spaced to provide equivalent area of anchorage to that required by this section.

R-404.8.2 Vertical Lateral Support: Vertical lateral support of masonry walls in Seismic Zones No. 0, 1, or 2 shall be provided in accordance with one of the methods in R-404.8.2.1 or R-404.8.2.2.

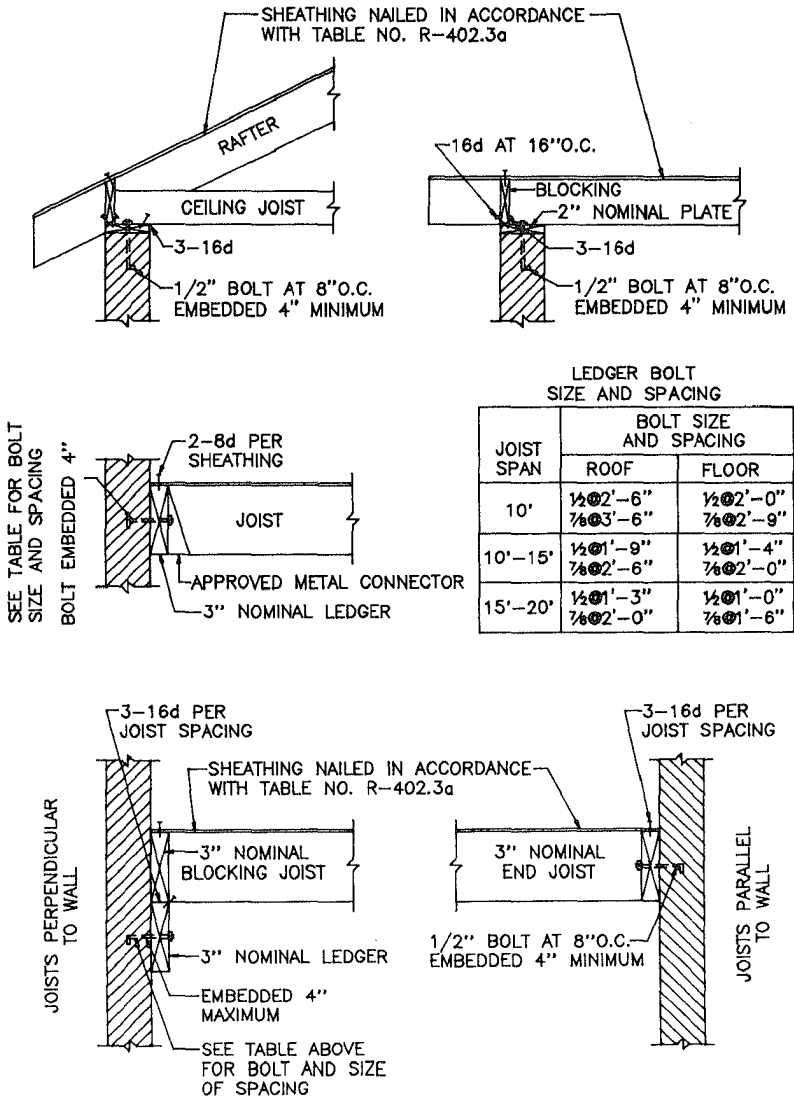
R-404.8.2.1 Roof structures: Masonry walls shall be anchored to roof structures with metal strap anchors, 1/2-inch bolts, or other approved anchors spaced not more than 6 ft. on center. Anchors shall be embedded at least 16 inches into the masonry, or be hooked or welded to bond beam reinforcement placed not less than 6 inches from the top of the wall.

R-404.8.2.2 Floor Diaphragms: Masonry walls shall be anchored to floor diaphragms at intervals not to exceed 6 feet. Support shall be provided by metal strap anchors or 1/2 inch diameter bolts installed as shown in Figure No. R-404.10, or by other approved methods.

R-404.9 Lintels: Masonry over openings shall be supported by steel lintels, reinforced concrete or masonry lintels or masonry arches, designed to support load imposed. Lintels and arches shall be constructed of materials and designed in accordance with the AISC-ASD or AISC-LRFD, BIA Technical Notes 17H, 31A, or 31B, NCMA TR 91, NCMA TEK 25A or NCMA TEK 81, listed in Section S-26.404.

R-404.10 Anchorage: Masonry walls shall be anchored to floor and roof systems in accordance with the details shown in Figure No. R-404.10, R-404.11a or R-404.11b. Footings may be considered as points of lateral support.

Figure No. R-404.10
ANCHORAGE REQUIREMENTS FOR MASONRY WALLS
LOCATED IN SEISMIC ZONE NO. 0, 1 OR 2 AND WHERE
WIND LOADS ARE LESS THAN 30 psf



WHERE BOLTS ARE LOCATED IN HOLLOW MASONRY THE CELLS IN THE COURSES RECEIVING THE BOLTS SHALL BE GROUTED SOLID

R-404.11 Reinforcement: Masonry walls subject to wind loads of 30 pounds per sq ft or greater, or located in Seismic Zone No. 3 or 4 as established in Table No. R-201.2, shall be constructed in accordance with the requirements of this chapter and Figure Nos. R-404.11a and R-404.11b. In addition, the minimum area of reinforcement shall be not less than 0.002 times the gross cross-sectional area of the wall, not more than two-thirds of which may be used in either direction. No required vertical reinforcement shall be less than 3/8 inch in diameter. Principal wall reinforcement shall have a maximum spacing of 4 ft on center. A lesser amount of reinforcement may be used to resist tensile stresses as specified in Section R-404.12 for partially reinforced masonry construction.

R-404.12 Protection for reinforcement: (No change to remainder of section)

R-404.13 Beam supports: Beams, girders or other concentrated loads supported by a wall or column shall have a bearing of at least 3 inches in length measured parallel to the beam upon solid masonry not less than 4 inches in thickness, or upon a metal bearing plate of adequate design and dimensions to distribute the load safely, or upon a continuous reinforced masonry member projecting not less than 4 inches from the face of the wall.

Joists shall have a bearing of not less than 1-1/2 inches except as provided above, and shall be supported in accordance with Figure No. R-404.10.

R-404.14 Metal accessories: (No change to remainder of section)

R-404.14.1 Corrosion protection: Minimum corrosion protection of joint reinforcement, anchor ties and wire fabric for use in masonry wall construction shall conform to Table No. R-404.14.1.

Section R-405.1.2, page 71. Delete existing sections R-405.1.2, R-405.1.3, R-405.1.4 and substitute the following (R75-93):

R-405.1.2 Masonry unit placement: The mortar shall be sufficiently plastic and units shall be placed with sufficient pressure to extrude mortar from the joint and produce a tight joint. Deep furrowing of bed joints which produces voids shall not be permitted. Any units disturbed to the extent that initial bond is broken after initial placement shall be removed and relaid in fresh mortar. Surfaces to be in contact with mortar shall be clean and free of deleterious materials.

All solid masonry units shall be laid with full head and bed joints and all interior vertical joints that are designed to receive mortar shall be filled.

For hollow masonry units, all head and bed joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell.

Section R-406, pages 72-73. Delete section without substitution, renumber existing R-407 through R-414 (R64-92).

Section R-408, page 75 and 76. Delete existing sections R-408, R-409 and R-410 and replace with the following, renumber existing sections R-411 through R-414 (R78-93):

SECTION R-408 – GROUTED MASONRY

R-408.1 General: Grouted multiple-wythe masonry is a form of construction in which the space between the wythes is solidly filled with grout. It is not necessary for the cores of masonry units to be filled with grout.

Grouted hollow unit masonry is a form of construction in which certain cells of hollow units are continuously filled with grout.

R-408.1.1 Mortar and grout: Only Type M or Type S mortar mix consisting of portland cement, hydrated lime and sand in accordance with ASTM C 270 listed in Section S-26.408 shall be used to construct masonry wythes. Grout shall consist of cementitious material and aggregate in accordance with ASTM C 476 listed in Section S-26.408. Type M or Type S mortar to which sufficient water has been added to produce pouring consistency can be used as grout.

R-408.1.2 Grouting requirements: Maximum pour heights and the minimum dimensions of spaces provided for grout placement shall conform to Table R-408.1.2. If the work is stopped for one hour or longer, the horizontal construction joints shall be formed by stopping all tiers at the same elevation and with the grout 1 inch below the top.

**Table No. R-408.1.2
GROUT SPACE DIMENSIONS
AND POUR HEIGHTS**

Grout Type	Grout pour maximum height (feet)	Minimum width of grout spaces^{1,2} (inches)	Minimum grout^{2,3} space dimensions for grouting cells of hollow units (inches x 43inches)
Fine	1	3/4	1 1/2 x 2
	5	2	2 x 3
	12	2 1/2	2 1/2 x 3
	24	3	3 x 3
Coarse	1	1 1/2	1 1/2 x 3
	5	2	2 1/2 x 3
	12	2 1/2	3 x 3
	24	3	3 x 4

¹For grouting between masonry wythes.

²Grout space dimension is the clear dimension between any masonry protrusion and shall be increased by the horizontal projection of the diameters of the horizontal bars within the cross section of the grout space.

³Area of vertical reinforcement shall not exceed 6% of the area of the grout space.

R-408.1.3 Grout space (cleaning): Provision shall be made for cleaning grout space. Mortar projections which project more than 1/2 inch into grout space and any other foreign matter shall be removed from grout space prior to inspection and grouting.

R-408.1.4 Grout placement: Grout shall be a plastic mix suitable for pumping without segregation of the constituents and shall be mixed thoroughly. Grout shall be placed by pumping or by an approved alternate method and shall be placed before any initial set occurs and in no case more than one and one-half hours after water has been added.

Grouting shall be done in a continuous pour, in lifts not exceeding 4 feet. It shall be consolidated by puddling or mechanical vibrating during placing and reconsolidated after excess moisture has been absorbed but before plasticity is lost.

Grout shall not be pumped through aluminum pipes.

R-408.1.5 Cleanouts: Where required by the building official, cleanouts shall be provided as specified in this section. The cleanouts shall be sealed before grouting and after inspection.

R-408.1.5.1 Grouted Multiple-Wythe Masonry: Cleanouts shall be provided at the bottom course of the exterior wythe at each pour of grout where such pour exceeds 5 feet in height.

R-408.1.5.2 Grouted Hollow Unit Masonry: Cleanouts shall be provided at the bottom course of each cell to be grouted at each pour of grout, where such pour exceeds 4 feet in height.

R-408.1.6 Inspection: Special inspection during grouting shall be provided where required by the building official.

R-408.2 Grouted Multiple-Wythe Masonry: Grouted multiple-wythe masonry shall conform to all the requirements specified in Section R-408.1 and also the requirements of this section.

R-408.2.1 Bonding of backup wythe: Where all interior vertical spaces are filled with grout in multiple-wythe construction, masonry headers shall not be permitted. Metal wall ties shall be used in accordance with Section R-407.1.2 to prevent spreading of the wythes and to maintain the vertical alignment of the wall. Wall ties shall be installed in accordance with Section R-407.1.2, when the backup wythe in multiple-wythe construction is fully grouted.

R-408.2.2 Grout spaces: Fine grout shall be used when interior vertical space to receive grout does not exceed 2 inches in thickness. Interior vertical spaces exceeding 2 inches in thickness shall use coarse or fine grout.

R-408.2.3 Grout barriers: Vertical grout barriers or dams shall be built of solid masonry across the grout space the entire height of the wall to control the flow of the grout horizontally. Grout barriers shall not be more than 25 feet apart.

The grouting of any section of a wall between control barriers shall be completed in one day with no interruptions greater than one hour.

R-408.3 Reinforced Grouted Multiple-Wythe Masonry: Reinforced grouted multiple-wythe masonry shall conform to all the requirements specified in Sections R-408.1 and R-408.2 and also the requirements of this section.

R-408.3.1 Construction: The thickness of grout or mortar between masonry units and reinforcement shall be not less than 1/4 inch, except that 1/4-inch bars may be laid in horizontal mortar joints at least 1/2 inch thick, and steel wire reinforcement may be laid in horizontal mortar joints at least twice the thickness of the wire diameter.

R-408.4 Reinforced Hollow Unit Masonry: Reinforced hollow unit masonry shall conform to all the requirements of Section R-408.1 and also the requirements of this section.

R-408.4.1 Construction: Requirements for construction shall be as follows:

1. All reinforced hollow-unit masonry shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Walls and cross webs forming such cells to be filled shall be full-bedded in

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mortar to prevent leakage of grout. All head and end joints shall be solidly filled with mortar for a distance in from the face of the wall or unit not less than the thickness of the longitudinal face shells. Bond shall be provided by lapping units in successive vertical courses or by equivalent mechanical anchorage.

2. Cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed continuous vertical cell of dimensions prescribed in Table No. R-408.1.2.
3. Vertical reinforcement shall be held in position at top and bottom and at intervals not exceeding 200 diameters of the reinforcement.
4. All cells containing reinforcement shall be filled solidly with grout. Grout shall be poured in lifts of 8-foot maximum height. When total grout pour exceeds 8 feet in height, the grout shall be placed in lifts not exceeding 4 feet and special inspection during grouting shall be required.
5. Horizontal steel shall be fully embedded by grout in an uninterrupted pour.

Section R-413, page 78. Revise section to read as follows (R66-92):

SECTION R-413

PLYWOOD AND WOOD STRUCTURAL PANELS

R-413.1 Identification and grade: Plywood shall conform to DOC PS 1, DOC PS 2, HPMA (ANSI) HP, APA E30, APA Y510 or HPMA HP-SG, listed in Section S-26.413. Wood structural panels shall conform to DOC PS 2 listed in Section S-26.413. All panels shall be identified by a grade mark or certificate of inspection issued by an approved agency. Wood structural panels shall comply with the grades specified in Table No. R-402.3b.

R-413.2 Allowable spans: The maximum allowable spans for wood structural panel wall sheathing shall not exceed the values set forth in Table R-402.3b.

R-413.3 Installation: Wood structural panel wall sheathing shall be attached to framing in accordance with Table No. R-402.3a. Wood structural panels marked Exposure 1 or Exterior are considered water-repellent sheathing under the code.

Chapters 4, 5, 6 pages 45 thru 103. Reorder chapters as follows and renumber sections accordingly (R56-93):

Chapter 4 - FLOORS

Chapter 5 - WALL CONSTRUCTION

Chapter 6 - WALL COVERING

Chapter 5

Section R-502, pages 79 thru 82. Delete entire section and replace with the following (R67-92, R82-93, R83-93, R84-93, R85-93, R86-93, R87-93, R88-93, R89-93, R90-93, R91-93, R92-93):

R-502.1 General: Interior coverings shall be installed in accordance with this chapter and Table Nos. R-502.3, R-503.3a and R-503.3b. Interior finishes and materials shall conform to the flamespread and smoke density requirements of Section R-217.

R-502.2 Interior plaster: Gypsum plaster or portland cement plastering materials shall conform to ASTM C5, C28, C35, C37, C59, C61, C587, C588, C631, C847, C897, C926, C933, C1032, and C1047 listed in Section S26.502 and shall be installed or applied in conformance with ASTM C841, C842, C843, C844, and C1063 listed in Section S-26.502. Plaster shall be not less than three coats when applied over metal lath and not less than two coats when applied over other bases permitted by this section, except that veneer plaster may be applied in one coat not to exceed 3/16 inch thickness, provided the total thickness is as set forth in Table No. R-503.7a.

Support spacing for gypsum and metal lath on walls or ceilings shall not exceed 16 inches, or 24 inches for 1/2 inch plain gypsum lath, or as otherwise approved. Gypsum lath shall be installed at right angles to support framing with end joints staggered.

Where vapor barriers are required in conjunction with water-resistant gypsum backing board, the vapor barrier shall be installed in accordance with GA 230 listed in Section S-26.502.

R-502.3 Gypsum wallboard: All gypsum wallboard materials and accessories shall conform to ASTM C36, C475, C514, C557, C960, C1002 and C1047 listed in Section S-26.502 and shall be installed in accordance with GA-216 and GA-224 listed in Section S-26.502 and the provisions of this section. Interior gypsum wallboard shall not be installed where it will be exposed to the weather during construction.

Framing supporting gypsum wallboard shall not be less than 2 inches nominal thickness in the least dimension except that furring strips not less than 1 inch by 2 inch nominal dimension may be used over solid backing or framing spaced not more than 24 inches on center. Support

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spacing and size and spacing of fasteners shall comply with Table No. R-502.3. Gypsum wallboard may be applied at right angles or parallel to framing members. All edges and ends of gypsum wallboard shall occur on the framing members, except those edges and ends which are perpendicular to the framing members.

**Table No. R-502.3
APPLICATION AND MINIMUM THICKNESS OF
GYPSUM WALLBOARD**

THICK- NESS OF GYPSUM WALL- BOARD (inch)	PLANE OF FRAMING SURFACE ⁵	LONG DIMENSION OF GYPSUM WALLBOARD SHEETS IN RELATION TO DIRECTION OF FRAMING MEMBERS	MAXIMUM SPACING OF FRAMING MEMBERS (center-to- center in inches)	MAXIMUM SPACING OF FASTENERS (center-to-center, in inches)		NAILS ¹ -TO WOOD
				Nails ^{1, 2}	Screws ³	
Fastening required without adhesive application.						
3/8	Horizontal ⁴	Perpendicular	16	7	12	No. 13 gauge 1 1/4" long, 19/64" head 0.098" diameter 1 1/4 long, annular-ringed; 4d cooler nail
	Vertical	Either direction	16	8	12	
1/2	Horizontal	Either direction	16	7	12	No. 13 gauge 1 3/8" long, 19/64" head 0.098" diameter 1 1/4 long, annular-ringed; 5d cooler nail
	Horizontal	Perpendicular	24	7	12	
	Vertical	Either direction	24	8	12	
5/8	Horizontal	Either direction	16	7	12	No. 13 gauge 1 5/8" long, 19/64" head 0.098" diameter 1 3/8 long, annular-ringed; 6d cooler nail
	Horizontal	Perpendicular	24	7	12	
	Vertical	Either direction	24	8	12	
With adhesive application.						
3/8	Horizontal ⁴	Perpendicular	16	16	16	Same as above for 3/8"
	Vertical	Either direction	16	16	24	
1/2 or	Horizontal	Either direction	16	16	16	As required for 1/2" and 5/8" gypsum wallboard, see above
		Perpendicular	24	12	16	
5/8	Vertical	Either direction	24	24	24	
2-3/8 layers	Horizontal	Perpendicular	24	16	16	Base ply nailed as required for 1/2" gypsum wallboard and face ply placed with adhesive
	Vertical	Either direction	24	24	24	

¹Where the metal framing has a clinching design formed to receive the nails by two edges of metal, the nails shall be not less than 5/8 inch longer than the wallboard thickness and shall have ringed shanks. Where the metal framing has a nailing groove formed to receive the nails, the nails shall have barbed shanks or be 5D, No. 13 1/2 gauge, 1 5/8 inches long, 15/64-inch head for 1/2-inch gypsum wallboard; 6d, No. 13 gauge, 1 7/8 inches long, 15/64-inch head for 5/8-inch gypsum wallboard.

²Two nails spaced not less than 2 inches apart, nor more than 2 1/2 inches apart may be used where the pairs are spaced 12 inches on center except around the perimeter of the boards.

1993/1994 Amendments

³Screw shall be Type S or W per ASTM C1002 listed in Section S-26.502 and long enough to penetrate wood framing not less than 5/8 inch and metal framing not less than 1/4 inch.

⁴Three-eighths-inch single-ply gypsum board shall not be installed if water-based spray-textured finish is applied nor to support insulation above a ceiling.

⁵Horizontal refers to applications such as ceilings. Vertical refers to applications such as walls.

R-502.4 Bath tub and shower spaces: Bath tub and shower floors and walls shall be finished with a smooth, hard and nonabsorbent surface. Ceramic tile surfaces shall be installed in accordance with ANSI A108.1, A108.4, A108.5, A108.6, A108.11, A118.1, A118.3, A136.1 and A137.1 listed in Section S-26.502. Such wall surfaces shall extend to a height of not less than 6 ft above the floor.

Gypsum board utilized as the base or backer board for adhesive application of ceramic tile or other nonabsorbent finish material shall conform with ASTM C 630 listed in Section S-26.502. Water-resistant gypsum backing board shall be permitted to be used on ceilings where framing spacing does not exceed 12 inches on centers. All cut or exposed edges, including those at wall intersections, shall be sealed as recommended by the manufacturer.

R-502.5 Other finishes: Wood veneer or hardboard paneling not less than 1/4-inch nominal thickness (13/64-inch actual) shall conform to HPMA (ANSI) HP listed in Section S-26.502 for wood veneer and AHA (ANSI) A135.5-1988 for hardboard paneling. These finishes may be installed directly to studs with maximum 16 inches on center spacing; wood veneer or hardboard paneling less than 1/4-inch nominal thickness must have not less than 3/8-inch gypsum board backer, unless the qualifying test were made with the material suspended from the noncombustible backing, and stud spacing may not exceed 16 inches on center.

Wood shakes and shingles shall conform to CSSB "Grading Rules for Wood Shakes and Shingles" listed in Section S-26.502 and shall be applied in accordance with the CSSB "Design and Application Manual for Exterior and Interior Walls" listed in Section S-26.502.

Section 503, pages 82-91. Revise section to read as follows (R68-92, R70-92, R71-92, R72-92, R84-93, R93-93, R94-93, R95-93, R96-93, R97-93, R98-93, R99-93, R100-93, R102-93, R105-93, R106-93, R107-93, R108-93):

SECTION R-503 — EXTERIOR COVERING

R-503.1 General: (No change to existing section)

R-503.2 Weather-resistant sheathing paper: Asphalt-saturated felt free from holes and breaks and weighing not less than 14 pounds per

100 sq ft or other approved weather-resistant material shall be applied over studs or sheathing of all exterior walls as required by Table No. R-503.4. Such felt or material shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches. Where joints occur, felt shall be lapped not less than 6 inches.

Such felt or material may be omitted:

1. In detached accessory buildings.
2. Under panel siding with shi lap joints or battens.
3. Under exterior wall finish materials as permitted in Table No. R-503.4
4. Under paperbacked stucco lath.
5. Over water-repellent sheathing materials.

R-503.3 Wood, plywood, and wood structural panel siding: Joints in wood, plywood or wood structural panel siding shall be made as follows unless otherwise approved. Vertical joints in panel siding shall occur over framing members, unless wood or wood structural panel sheathing is used, and shall be shi lapped or covered with a batten. Horizontal joints in panel siding shall be lapped a minimum of 1 inch or shall be flashed with Z-flashing.

Horizontal siding shall be lapped a minimum of 1 inch, or 1/2 inch if rabbeted, and shall have the ends caulked, covered with a batten, or sealed and installed over a strip of flashing.

R-503.4 Attachment: All wall coverings shall be securely fastened in accordance with Table No. R-503.4 or with other approved aluminum, stainless steel, zinc-coated, or other approved corrosion-resistive fasteners.

Wood shingles or shakes shall be applied in accordance with the CSSB "Design and Application Manual for Exterior and Interior Walls" listed in Section S-26.503. Wood shingles or shakes attached with approved corrosion-resistive annular grooved nails may be applied over fiberboard shingle backer and approved nail-base-type fiberboard sheathing not less than 1/2 inch nominal thickness in accordance with Table No. R-503.4.

Table No. R-503.4
WEATHER-RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

Siding Material		Nominal Thickness ¹ (inches)	Joint Treatment	Sheathing Paper Required	Type of Supports for the Siding Material and Fasteners ^{2,3,4}				
					Wood or Wood Structural Panel Sheathing	Fiberboard Sheathing into Stud	Gypsum Sheathing into Stud	Direct to Studs	Number or Spacing of Fasteners
Horizontal aluminum ^{5,6}	without insulation	.019 ⁷	Lap	No	.120 nail 1 1/2" long	.120 nail 2" long	.120 nail 2" long	Not allowed	Same as stud spacing
		.024	Lap	No	.120 nail 1 1/2" long	.120 nail 2" long	.120 nail 2" long	Not allowed	
	with insulation	.019	Lap	No	.120 nail 1 1/2" long	.120 nail 2 1/2" long	.120 nail 2 1/2" long	.120 nail 1 1/2" long	
Brick veneer		2	Sec. 503	yes (15)	See Sec. R-503 and Figure No. R-503.4 ¹⁰				
Concrete masonry veneer		2							
Hardboard ¹⁴ Board and batten-vertical		7/16	(9)	(9)	.099 nail 2" long	.099 nail 2 1/2" long	.099 nail 2" long	.099 nail 1 3/4" long	6" panel edges 8" inter. sup
Hardboard ¹⁴ Lap-siding-horizontal		7/16	(9)	(9)	.099 nail 2" long	.099 nail 2 1/2" long	.099 nail 2 1/4" long	.099 nail 2" long	Same as stud spacing 2 per bearing

(Continued)

Table No. R-503.4 (Continued)

Siding Material	Nominal Thickness ¹ (inches)	Joint Treatment	Sheathing Paper Required	Type of Supports for the Siding Material and Fasteners ^{2,3,4}				
				Wood, or Wood Structural Panel Sheathing	Fiberboard Sheathing into Stud	Gypsum Sheathing into Stud	Direct to Studs	Number or Spacing of Fasteners
Steel ¹¹	29 ga.	Lap	No	.113 nail 1 3/4" Staple-1 3/4"	.113 nail 2 3/4" Staple-2 1/2"	.113 nail 2 1/2" Staple-2 1/4"	Not allowed	Same as stud spacing
Stone veneer	2	Sec. 503	Yes	See Sec. R-503 and Figure No. R-503.4				
Particleboard panels	3/8 - 1/2	(9)	(9)	6d box nail	6d box nail	6d box nail	6d box nail, 3/8 not allowed	6" panel edges 12" inter.
	5/8	(9)	(9)	6d box nail	8d box nail	8d box nail	6d box nail	support
Plywood panel ¹² (exterior grade)	3/8	(9)	(9)	.099 nail-2" staple-1 3/8"	.113 nail-2 1/2" staple-2 1/4"	.099 nail-2" staple-2"	.099 nail-2" staple-1 3/8"	6" on edges 12" inter. sup.
Vinyl Siding	.035	Lap	No	.120 nail 1 1/2" Staple 1 3/4"	.120 nail 2" Staple 2 1/2"	.120 nail 2" Staple 2 1/2"	Not Allowed	Same as stud spacing
Wood ¹³ Rustic, drop Shiplap	3/8 Minimum 19/32 Average	Lap	No	Fastener penetration into stud-1"			.113 nail-2 1/2" Staple 2"	Face nailing up to 6" widths, 1 nail per bearing; 8" widths and over, 2 nails per bearing
Bevel Butt tip	7/16 3/16	Lap Lap	No No					
Shakes ⁸	3/8	Lap	Yes	.0915 nail-2"		Staple 2"		
Shingles ⁸	3/8	Lap	Yes	16" and 18" shingles		.076 nail-1 1/4" Staple-1 1/4"		2-fasteners per shingle or shake
				24" shingles		.080 nail-1 1/2" Staple 1 1/2"		

44 **Notes:**

- ¹Based on stud spacing of 16 inches o.c. Where studs are spaced 24 inches, siding may be applied to sheathing approved for that spacing.
- ²Nail is a general description and may be T-head, modified round head, or round head with smooth or deformed shanks.
- ³Staples shall have a minimum crown width of 7/16-inch O.D. and be manufactured of minimum No. 16 gauge wire.
- ⁴Nails or staples must be aluminum, galvanized, or rust-preventive coated and shall be driven into the studs for fiberboard or gypsum backing.
- ⁵Aluminum nails or other nails complying with AAMA 1402 listed in section S-26-503 shall be used to attach aluminum siding.
- ⁶As an alternate to the values of Table R-503.6, aluminum siding complying with AAMA 1402 listed in Section S-26.503 may be used.
- ⁷Aluminum (.019 inch) may be unbacked only when the maximum panel width is 10 inches and the maximum flat area is 8 inches. The tolerance for aluminum siding shall be ± 0.002 inch of the nominal dimension.
- ⁸Shingles and shakes applied over regular density fiberboard or gypsum sheathing shall be fastened to horizontal wood nailers or fiberboard shingle backer.
- ⁹If boards are applied over sheathing or weather-resistant membrane, joints need not be treated. Otherwise vertical joints must occur at studs and be covered with battens or be lapped.
- ¹⁰All attachments shall be coated with a corrosion-resistive coating.
- ¹¹Shall be of approved type.
- ¹²Three-eighths-inch plywood may be applied directly to studs spaced 16 inches on center. One-half-inch plywood may be applied directly to studs spaced 24 inches on center.
- ¹³Woodboard sidings applied vertically shall be nailed to horizontal nailing strips or blocking set 24 inches o.c. Nails shall penetrate 1 1/2 inches into studs, studs and wood sheathing combined, or blocking. A weather-resistant membrane shall be installed weatherboard fashion under the vertical siding unless the siding boards are lapped or battens are used.
- ¹⁴Hardboard siding shall comply with AHA A135.6 listed in Section S-26.503.
- ¹⁵For masonry veneer, a weather resistant membrane or building paper is not required over water repellent sheathing materials when a 1-inch air space is provided between the veneer and the sheathing. When the 1-inch space is filled with mortar, a weather resistant membrane or building paper is required over studs or sheathing.
- ¹⁶Vinyl siding shall comply with ASTM D3679 listed in section S-26.503.

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R-503.5 Wood shakes and shingles: Wood shakes and shingles shall conform to CSSB "Grading Rules for Wood Shakes and Shingles."

R-503.6 Exterior lath: All lath and lath attachments shall be of corrosion-resistant materials. Expanded metal or woven wire lath shall be attached with 1 1/2 inch long, 11 gage nails having a 7/16 inch head, or 7/8 inch long, 16 gage staples, spaced at no more than 6 inches, or as otherwise approved.

R-503.7 Exterior Plaster: Delete 3rd paragraph without substitution.

Table No. 503.7a Thickness of Plaster (no change to table)

Table No. 503.7b Gypsum Plaster Proportions (no change to table)

Table No. 503.7c Portland Cement Plaster (no change to table)

R503.8 Masonry veneer, general: All masonry veneer shall be installed in accordance with this chapter, Figure No. R-503.8 and Table No. R-503.4. Exterior masonry veneer shall not be laterally supported by wood frame at any point more than 25 ft above the adjacent ground elevation in Seismic Zones 3 and 4 nor more than 35 ft in Seismic Zones 0, 1 or 2. Masonry veneers and veneers of concrete or stone may be vertically supported by wood foundations in accordance with NFoPA Technical Report No. 7 listed in Section S-26.503.

Exceptions:

1. Veneers used as interior wall finishes may be supported on wood floors which are designed to support the loads imposed.
2. Exterior masonry veneers having an installed weight of 40 psf or less may be supported on wood construction. When the masonry veneer is supported by wood construction that adjoins the masonry veneer supported by the foundation, there shall be a movement joint between the veneer supported by the wood construction and the foundation. The wood construction supporting the masonry veneer shall be designed to limit deflection to 1/600 of the span for the supporting members.

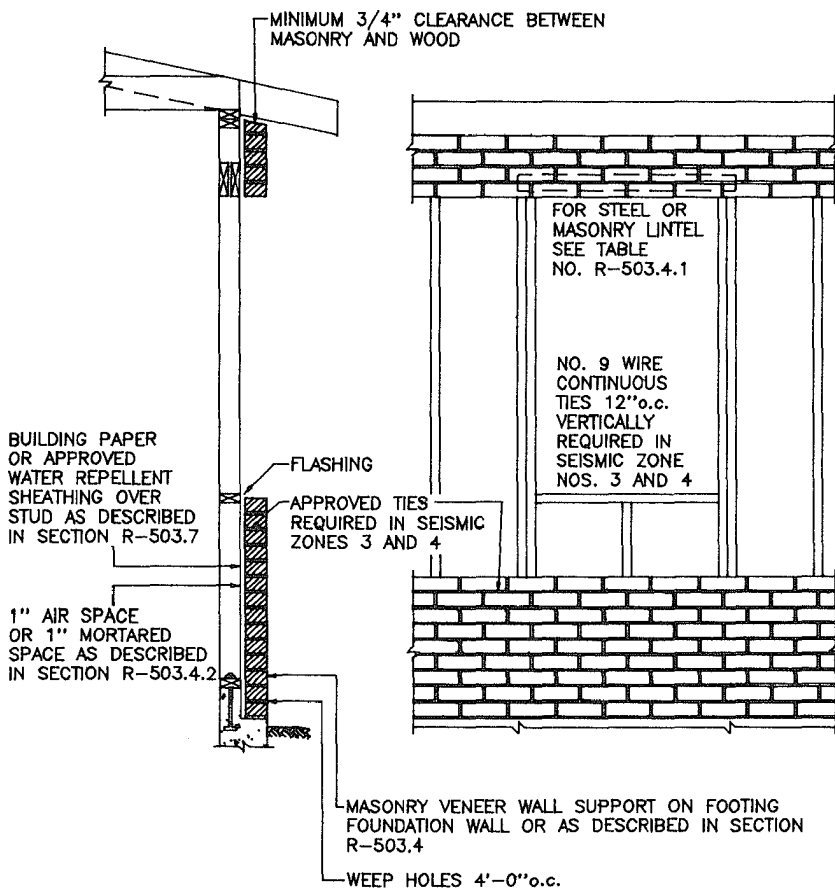
R503.8.1 Lintels: (No change to existing section)

Table No. 503.8.1 Allowable Spans for Lintels Supporting Masonry Veneer (No change to table)

R503.8.2 Attachment: Masonry veneer shall be attached to the supporting wall with corrosion-resistant metal ties.

Veneer ties, if strand wire, shall not be less in thickness than No. 9 U.S. gage wire and shall have a hood embedded in the mortar joint, or if sheet metal, not less than No. 22 U.S. gage by 7/8 inch corrugated. Each tie shall be spaced not more than 24 inches on center horizontally and shall support not more than 3 1/4 sq ft of wall area.

Figure No. R-503.8
MASONRY VENEERED WALL DETAIL



Exception: In Seismic Zone No. 3 or 4 and in wind area of more than 30 pounds per sq ft, each tie shall support not more than 2 sq ft of wall area.

In Seismic Zones 3 and 4, veneer ties shall be mechanically attached to horizontal joint reinforcement wire of No. 9 gage or equivalent. The horizontal joint reinforcement shall be continuous in the veneer bed joint with lap splices permitted between the veneer tie spacing.

When applied over stud construction, the studs shall be spaced a maximum of 24 inches on centers and approved paper shall first be applied over the sheathing or wires between the studs, except as otherwise provided in Section R-503.2 and mortar shall be slushed into the 1 inch space between facing and paper.

As an alternate, an air space of at least 1 inch may be maintained between the backing and the veneer, in which case a weather-resistant membrane or felt sheathing paper or approved water-repellent sheathing shall be applied over the studs.

In lieu of such wire ties, an approved method of grouting the veneer to a paperbacked reinforcement attached directly to the studs may be used.

R503.9 Flashing: Approved corrosion-resistive flashing shall be provided at top and sides of all exterior window and door openings in such a manner as to be leakproof, except that self-flashing windows having a continuous lap of not less than 1 1/8 inches over the sheathing material around the perimeter of the opening, including corners, do not require additional flashing; jamb flashing may also be omitted when specifically approved by the building official. Similar flashings shall be installed at the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings; under and at the ends of masonry, wood or metal copings and sills; continuously above all projecting wood trim; where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction; at wall and roof intersections.

Chapters 4, 5, 6 pages 45 thru 103. Reorder chapters as follows and renumber sections accordingly (R56-93):

Chapter 4 - FLOORS

Chapter 5 - WALL CONSTRUCTION

Chapter 6 - WALL COVERING

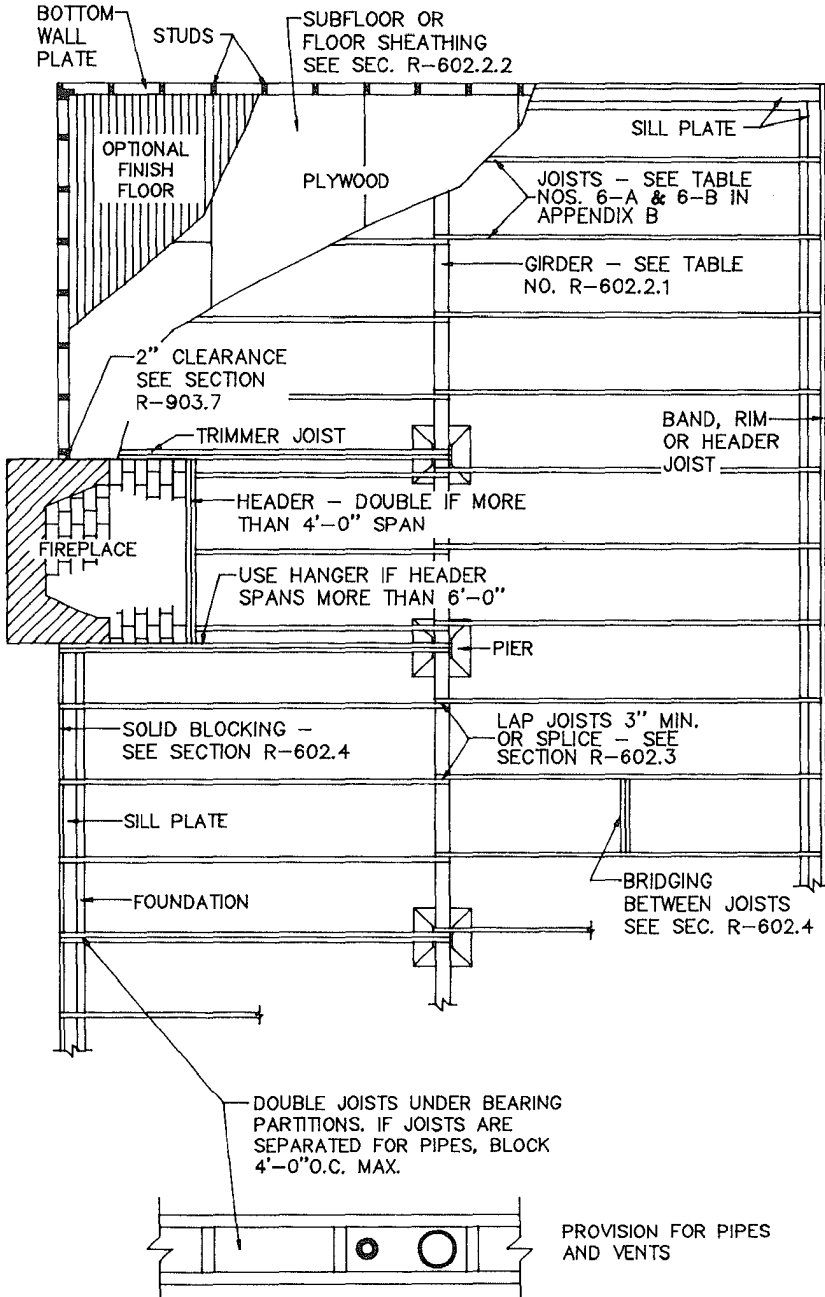
Chapter 6

Section R-601.2, page 93. Revise section to read as follows (R73-92):

R-601.2 Requirements: Floor construction shall be capable of accommodating all loads imposed according to Section R-201 and Transmitting the resulting loads imposed according structural elements.

Figure No. R-601.2, page 94. Delete existing figure and substitute the following: (R109-93):

**Figure No. R-601.2
FLOOR CONSTRUCTION**



Section R-602.1, page 93. Revise section to read as follows (R74-92, R110-93):

R-602.1 Identification and grade: Load-bearing dimension lumber for joists, beams and girders shall conform to DOC PS20-70 and to other applicable standards or grading rules and shall be so identified by a grade mark or certificate of inspection issued by an approved agency. The grade mark or certificate shall provide adequate information to determine F_b , the allowable stress in bending, and E, the modulus of elasticity.

Preservatively treated dimension lumber shall also be identified by the quality mark of an approved agency.

Blocking shall be a minimum of Utility grade lumber. Subflooring may be a minimum of Utility grade lumber or No. 4 Common grade boards.

Approved end-jointed lumber may be used interchangeably with solid-sawn members of the same species and grade.

Section R-602.2, page 93. Add new section to read as follows and renumber existing R-602.2 through R-602.9 (R73-92, R111-93):

R-602.2 Design and construction: Floors of wood construction shall be designed and constructed in accordance with the provisions of this chapter and Figure No. R-601.2, or with the NFOPA "National Design Specification for Wood Construction," HPMA (ANSI) LHF, the "Canadian Dimension Lumber Data Book," the "Western Lumber Span Tables for Floor and Ceiling Joists and Roof Rafters," or the "Southern Pine Maximum Spans for Joists and Rafters" listed in section S-26.602.

Section R-602.2.1, page 93. Add the following paragraph to the section as follows (R112-93):

R-602.2.1 Joists, beams and girders: The clear span of floor joists shall not exceed the values set forth in Table Nos. 6-A and 6-B in Appendix B. The modulus of elasticity, E, and the actual stress in bending, F_b , shown in the tables shall not exceed the values specified in Table Nos. 6/7A and 6/7B in Appendix B. The values for F_b , specified as "repetitive member use" may be used when floor joists are spaced not more than 24 inches on center.

Joists under parallel bearing partitions shall be doubled or a beam of adequate size to support the load shall be provided. Double joists which are separated to permit the installation of piping or vents shall be solid blocked spaced not more than 4 ft on center. (No changes to remainder of section)

Table No. R-602.2.1a, page 95. Revise the table as follows: (R113-93, R114-93):

Table No. R-602.2.1a

ALLOWABLE SPAN FOR GIRDERS SUPPORTING ONE FLOOR ONLY³

SIZE OF WOOD GIRDER ¹	FLOOR LIVE LOAD (psf)	SPACING BETWEEN GIRDERS OR BETWEEN GIRDERS AND LOAD BEARING WALLS				
		4'	6'	8'	10'	16'
4 x 4 —	30	5'-6"	4'-6"	3'-6"	3'-0"	2'-6"
	40	5'-0"	4'-0"	3'-6"	3'-0"	2'-6"
4 x 6 —	30	8'-0"	6'-6"	5'-6"	5'-0"	4'-6"
	40	7'-6"	6'-0"	5'-6"	4'-6"	4'-0"
4 x 8 6x6	30	11'-0"	9'-0"	8'-0"	7'-0"	5'-6"
	40	10'-0"	8'-6"	7'-6"	6'-6"	5'-0"
4 x 10 6x8	30	14'-0"	11'-6"	10'-0"	8'-6"	6'-0"
	40	13'-0"	10'-6"	9'-6"	8'-6"	5'-6"
4 x 12 6x10	30	16'-6"	14'-0"	12'-0"	11'-0"	9'-0"
	40	16'-0"	12'-6"	11'-0"	10'-0"	8'-0"

¹Spans are based on No. 2 lumber.

²The spacing is the tributary load to the girder. It is found by adding the unsupported spans of the floor structure on each side which are supported by the girder and dividing by 2.

³Allowable spans may be interpolated between tributary loads shown in table. Spans and girder sizes may be computed independently of the above table in accordance with accepted engineering practice.

Table No. R-602.2.1b, page 96 and 97. Delete existing table and substitute with the following: (R116-93):

**Table No. R-602.2.1b
ALLOWABLE SPANS FOR BUILT-UP WOOD CENTER GIRDERS
AND FOOTING SIZES FOR GIRDER SUPPORT COLUMNS**

Width of Structure (feet)	Girder Size (inches)	ONE STORY		TWO STORY		THREE STORY	
		Maximum Span (feet-in.)	Footing Size (Inches)	Maximum Span (feet-in.)	Footing Size (inches)	Maximum Span (feet-in.)	Footing Size (inches)
24	3-2x8	6-7	17x17*	4-11	20x20	4-1	22x22
	4-2x8	7-8	19x19*	5-8	21x21	4-9	24x24
	3-2x10	8-5	20x20*	6-3	23x23	5-3	25x25
	4-2x10	9-9	21x21	7-3	24x24	6-1	27x27
	3-2x12	10-3	22x22	7-8	25x25	6-4	27x27
	4-2x12	11-10	23x23	8-10	27x27	7-4	29x29
26	3-2x8	6-4	17x17*	4-9	20x20	3-11	22x22
	4-2x8	7-4	18x18*	5-6	22x22	4-7	24x24
	3-2x10	8-1	19x19	6-1	23x23	5-0	25x25
	4-2x10	9-4	21x21	7-0	24x24	5-10	27x27
	3-2x12	9-10	21x21	7-4	25x25	6-1	28x28
	4-2x12	11-5	23x23	8-6	27x27	7-1	30x30
28	3-2x8	6-2	17x17*	4-7	21x21	3-10	23x23
	4-2x8	7-1	18x18*	5-3	22x22	4-5	24x24
	3-2x10	7-10	19x19	5-10	23x23	4-10	26x26
	4-2x10	9-0	20x20	6-9	25x25	5-7	28x28
	3-2x12	9-6	21x21	7-1	26x26	5-11	28x28
	4-2x12	11-0	22x22	8-2	28x28	6-10	30x30
32	3-2x8	5-9	16x16*	4-3	21x21	3-7	24x24
	4-2x8	6-7	17x17	4-11	23x23	4-1	25x25
	3-2x10	7-4	18x18	5-5	24x24	4-6	27x27
	4-2x10	8-5	20x20	6-3	26x26	5-3	28x28
	3-2x12	8-11	20x20	6-8	27x27	5-6	29x29
	4-2x12	10-3	22x22	7-8	29x29	6-4	31x31

Notes:

1. Values shown are for a clear-span trussed roof, a load bearing center wall on the first floor in 2-story construction, and a load bearing center wall on the first and second floors in 3-story construction.
2. Spans based on allowable bending moment $F_b = 1000$ psi for repetitive members. See Table 6/7A in Appendix B.
3. Footing size based on 2000 psf soil bearing capacity; footing thickness shall be one-half (min.) the width of the footing.
4. 4x4 posts may be used at these (*) locations. 6x6 posts, or 4x4 posts or 3" diameter steel columns with bearing plates or equivalent area, are acceptable in all locations.

Section R-602.2.2, page 95. Add the following paragraph to the section as follows (R117-93):

R-602.2.2 Floor sheathing: The allowable spans for floor sheathing used as subflooring shall conform to the requirements set forth in Table Nos. R-602.2.2, R-606.1a, R-606.1b, and R-607.1.2.

End joints in lumber used as subflooring shall occur over supports unless end-matched lumber is used, in which case each piece shall bear on at least two joists. Subflooring may be omitted when joist spacing does not exceed 16 inches and a 1 inch nominal tongue-and-groove wood strip flooring is applied perpendicular to the joists.

Table No. R-602.2.2, page 95. Revise table heading to read as follows (R118-93):

Table No. R-602.2.2
MINIMUM THICKNESS OF LUMBER FLOOR SHEATHING

Section R-602.4, page 98. Revise section to read as follows (R119-93):

R-602.4 Lateral support and bridging: Joists shall be supported laterally at the ends by full-depth solid blocking not less than 2 inches in thickness; or by attachment to a header, band, or rim joist or to an adjoining stud; or shall be otherwise provided with lateral support to prevent rotation. Such lateral support is not required over intermediate supports such as center girders or bearing walls.

Joists having a depth-to-thickness ratio exceeding 6 to 1 based on nominal dimensions shall be supported laterally by solid blocking, diagonal bridging (wood or metal), or a continuous 1 by 3 inch strip nailed across the bottom of joists perpendicular to joists at intervals not exceeding 10 ft.

Section R-602.5, page 98. Revise section to read as follows. Combine sections R-602.5 and R-602.6 and renumber sections 602.7 through 602.9 (R121-93):

R-602.5 Drilling and notching. Notches in the top or bottom of joists shall not exceed one-sixth the depth of the joist and shall not be located in the middle third of the span. Where joists are notched on the ends for a ledger, the notch shall not exceed 1/4 the joist depth. Cantilevered joists shall not be notched unless the reduced section properties and lumber defects are considered in the design.

Holes drilled or bored in joists shall be within 2 inches of the top or bottom of joists, and their diameter shall not exceed 1/3 the depth of the joist.

Section R-602.7, page 98. Revise first paragraph to read as follows. Delete second and third paragraphs without substitution (R112-93, R117-93):

R-602.7 Fastening: Floor framing shall be nailed in accordance with Table No. R-402.3a. Where posts and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement.

Section R-602.8, page 98. Revise section to read as follows (R112-93, R-602.8 Framing of openings: Openings in floor framing shall be framed with a header and trimmer joists. When the header joist span does not exceed 4 ft, the header joist may be a single member the same size as the floor joist. Single trimmer joists may be used to carry a single header joist that is located within 3 ft of the trimmer joist bearing. When the header joist span exceeds 4 ft the trimmer joists and the header joist shall be doubled and of sufficient cross section to support the floor joists framing into the header. Approved hangers shall be used for the header joist to trimmer joist connections when the header joist span exceeds 6 ft.

Section R-603.1 page 99. Delete second paragraph, exception, and Table No. R-603.1 without substitution (R124-93):

Section R-603.2, page 99. Revise section to read as follows (R126-93):

R-603.2 Site preparation: The area within the foundation walls shall have all vegetation, top soil and foreign material.

R-603.2.1 Fill: Fill material shall be free of vegetation and foreign material. The fill shall be compacted to assure uniform support of the slab, and except where approved, the fill depths shall not exceed 24 inches for clean sand or gravel and 8 inches for earth.

Section R-605, page 101. Delete section substitute the following (R75-92):

SECTION R-605 – METAL

R-605.1 General: Elements shall be straight and free of any defects which would significantly affect structural performance.

R-605.2 Steel elements: Structural steel elements shall be designed and constructed in accordance with the AISC - ASD or AISC -LRFD specifications listed in section S-26.605. Cold-formed steel structural

elements shall be designed and constructed in accordance with the AISI-ASD or AISI-LRFD specifications listed in Section S-26.605.

R-605.3 Aluminum elements: Aluminum structural elements shall be constructed of materials and designed in accordance with AA SAS30 listed in Section S-26.605.

Section R-606, page 101. Revise section to read as follows (R76-92, R127-93):

SECTION R-606—PLYWOOD AND WOOD STRUCTURAL PANELS

R-606.1 Identification and grade: Plywood used for structural purposes shall conform to APA E30, APA Y510, DOC PS 1, DOC PS 2, HPMA (ANSI) HP, and HPMA HP-SG listed in Section S-26.606, and wood structural panels shall conform to DOC PS 2 listed in section S-26.606. All panels shall be identified by a grade mark of certificate of inspection issued by an approved agency.

Where used as structural subflooring, wood structural panels shall be of one of the grades specified in Table No. R-606.1a. When used as combination subflooring-underlayment, the grade shall be as specified in Table No. R-606.1b.

Wood structural-use panels conforming to DOC PS 2 includes performance rated plywood, oriented strandboard and composite panels. Oriented strandboard structural-use panels manufactured in Canada shall conform to CSA 0437.

R-606.2 Allowable spans: The maximum allowable span for wood structural panels used as subflooring and combination subfloor-underlayment shall be set forth in Table No. R-606.1a. The maximum span for plywood combination subfloor-underlayment shall be as set forth in Table No. R-606.1b.

R-606.3 Installation: Plywood and wood structural panels used as subfloor or combination subfloor-underlayment shall be attached to framing in accordance with Table No. R-402.3a.

Table R-606.1a, page 102. Delete table and substitute the following (R77-92):

Table No. R-606.1a
ALLOWABLE SPANS AND LOADS FOR
PLYWOOD AND WOOD STRUCTURAL PANELS
FOR ROOF AND SUBFLOOR SHEATHING AND
COMBINATION SUBFLOOR-UNDERLAYMENT^{1,2,3}

SPAN RATING	NOMINAL PANEL THICKNESS (Inch)	MAXIMUM SPAN (Inches)		LOAD (lbs. per sq. ft., at maximum span)		MAXIMUM SPAN (Inches)
		With Edge Support	Without Edge Support	Total Load	Live Load	
C-D, C-C, SHEATHING ⁴		ROOF ⁵				SUBFLOOR ⁵
12/0	5/16	12	12	40	30	0
16/0	5/16, 3/8	16	16	40	30	0
20/0	5/16, 3/8	20	20	40	30	0
24/0	3/8, 7/16, 1/2	24	20 ¹¹	40	30	0
24/16	7/16, 1/2	24	24	50	40	16
32/16	15/32, 1/2, 5/8	32	28	40	30	16 ⁹
40/20	19/32, 5/8, 3/4, 7/8	40	32	40	30	20 ^{9,10}
48/24	23/32, 3/4, 7/8	48	36	45	35	24
UNDERLAYMENT, C-C PLUGGED, SINGLE FLOOR		ROOF ⁵				COMBINATION SUBFLOOR- UNDERLAYMENT ⁸
16 o.c.	19/32, 5/8	24	24	50	40	16 ⁹
20 o.c.	19/32, 5/8, 3/4	32	32	40	30	20 ^{9,10}
24 o.c.	23/32, 3/4	48	36	35	25	24
32 o.c.	7/8, 1	48	40	50	40	32
48 o.c.	1-3/32, 1-1/8	60	48	50	40	48

¹The allowable loads were determined using a dead load of 10 lbs. per square foot. If the dead load exceeds 10 lbs. per square foot, then the live load shall be reduced accordingly.

²Panels continuous over two or more spans with long dimension perpendicular to supports. Spans shall be limited to values shown because of possible effect of concentrated loads.

³Applies to panels 24 inches or wider.

⁴Includes Structural 1 panels in these grades.

⁵Uniform load deflection limitation: 1/180 of span under live load plus dead load, 1/240 of span under live load only.

⁶Unsupported edges shall have tongue-and-groove joints or shall be supported with blocking unless nominal 1/4-inch thick underlayment or 1 1/2 inches of lightweight concrete or approved cellular concrete is placed over the subfloor, or 3/4 inch wood finish flooring is used. Allowable uniform live load at maximum span, based on deflection of 1/360 of span, is 100 lbs. per square foot.

⁷Lumber blocking, panel edge clips (one midway between each support, except two equally spaced between supports when span is 48 inches), tongue-and-groove panel edges, or other approved type of edge support.

⁸Unsupported edges shall have tongue-and-groove joints or shall be supported by blocking unless nominal 1/4-inch-thick underlayment or 3/4-inch wood finish flooring is used. Allowable uniform live load at maximum span, based on deflection of 1/360 of span, is 100 lbs. per square foot, except panels with a Span Rating of 48 oc are limited to 65 lbs. per square foot total uniform load at maximum span.

1993/1994 Amendments

⁹Maximum span 24 inches where 3/4-inch wood finish flooring is installed at right angles to joists.

¹⁰Maximum span 24 inches where 1 1/2 inches of lightweight concrete or approved cellular concrete is placed over the subfloor.

¹¹Maximum span 24 inches for 1/2-inch panels.

Table R-606.1b, page 102. Revise table to read as follows (R78-92):

**Table No. R-606.1b
ALLOWABLE SPANS FOR PLYWOOD
COMBINATION SUBFLOOR-UNDERLAYMENT¹**

IDENTIFICATION	SPACING OF JOISTS		
	16	20	24
Species Group²			
1	1/2	5/8	3/4
2, 3	5/8	3/4	7/8
4	3/4	7/8	1

¹Plywood continuous over two or more spans and face grain perpendicular to supports. Unsupported edges shall be tongue-and-groove or blocked except where nominal 1/4-inch-thick underlayment or 3/4-inch wood finish floor is used. Allowable uniform live load at maximum span based on deflection of 1/360 of span is 100 pounds per square foot.

²Applicable to all grades of sanded Exterior-type plywood.

Section R-607.1.2, page 103. Revise section to read as follows (R78-92):

R-607.1.2 Subfloor and combined subfloor-underlayment: Particleboard subfloor and combined subfloor-underlayment shall conform to Type 2-M-W or 2-M-3 and shall not exceed the maximum allowable spans as specified in Table No. R-607.1.2.

Table R-607.1.2, page 103. Revise table by moving reference to footnote 3 from “Maximum Spacing of Supports” to “Combination Subfloor-Underlayment,” and change note to read as follows (R80-92, R128-93):

Table R-607.1.2
ALLOWABLE SPANS FOR PARTICLEBOARD
SUBFLOOR AND COMBINED SUBFLOOR-UNDERLAYMENT^{1,4}

GRADE	THICKNESS (Inches)	MAXIMUM SPACING OF SUPPORTS (Inches) ²	
		SUBFLOOR	COMBINATION SUBFLOOR-UNDERLAYMENT ³
2-M-W	1/2	16	—
	5/8	20	16
	3/4	24	24
2-M-3	3/4	20	20

¹ All panels are continuous over two or more spans and the tongue-and-groove panels are installed with the long dimension perpendicular to supports.

² Uniform deflection limitation: 1/360 of the span under 100 psf minimum load.

³ Edges shall have tongue-and-groove joints or shall be supported with blocking unless 1/4-inch minimum thickness underlayment is installed or finish floor is 3/4-inch wood strip.

⁴ The allowable grade, panel thickness and support spacings are shown in Table R-607.1.2. The panels may be applied parallel or perpendicular to joists and shall be continuous over two or more spans. If the panels are applied perpendicular to the supports, the end joints of the panels shall be offset so that four panel corners will not meet. Cutouts for items such as plumbing and electrical shall be oversized to avoid a forced fit. A 1/2-inch gap must be provided between the panel and concrete and masonry walls. Tongue-and-groove panels will have marks indicating "this side down." Leave a 1/16-inch gap between all panel edges when used as a subfloor. When used as a combined subfloor-underlayment, leave a 1/16-inch gap on Type 2-M-3 panels but lightly butt the edges of Type 2-M-W panels. Nail panels no closer than 3/8 inch from edges. Sand panel edges flat if swelling results from adverse moisture conditions during construction. If the panels are to be installed under nontextile resilient flooring, they shall be covered with 1/4-inch-minimum-thickness underlayment.

Chapter 7

Section R-701.1 and R-701.2, page 105. Revise sections to read as follows (R73-92):

R-701.1 Application: The provisions of this chapter shall control the design and construction of the roof-ceiling system for all buildings. The use of materials or methods of construction not specified in this chapter accomplishing the purposes intended with this code and approved by the building official in accordance with this code and approved by the building official in accordance with Section R-108 shall be accepted as complying with this code.

R-701.2 Requirements: Roof-ceiling construction shall be capable of accommodating all loads imposed according to Section R-201 and shall transmit the resulting loads to its supporting structural elements.

Section R-702.1, page 105. Revise section to read as follows (R81-92):

R-702.1 Identification and grade: Load-bearing dimension lumber for rafters, trusses and ceiling joists shall conform to DOC PS20-70 and to other applicable standards or grading rules and be identified by a grade mark or certificate of inspection issued by an approved agency. The grade mark or certificate shall provide adequate information to determine F_b , the allowable stress in bending, and E , the modulus of elasticity. Approved end-jointed lumber may be used interchangeably with solid-sawn members of the same species and grade. Blocking shall be a minimum of utility grade lumber.

The allowable unit stresses for fire-retardant-treated lumber, including fastener values, shall be developed from an approved method of investigation which considers the effects of anticipated temperature and humidity to which the fire-retardant lumber will be subjected, the type of treatment and redrying process. The fire-retardant-treated lumber shall be graded by an approved agency.

Section R-702.2, page 105. Add new section to read as follows and renumber existing R-702.2 through R-702.9 (R73-92, R130-93):

R-702.2 Design and Construction: Roof-ceilings of wood construction shall be designed and constructed in accordance with the provisions of this chapter, or with the NFoPA "National Design Specification for Wood Construction," the "Canadian Dimension Lumber Data Book," the "Western Lumber Span Tables for Floor and Ceiling Joists and Roof Rafters," or the "Southern Pine Maximum Spans for Joists and Rafters" listed in Section S-26.702. Roof-ceilings shall be constructed in accordance with Figure Nos. R-404.9, R-404.10a, R-404.10b, and R-702.3 and nailed in accordance with Table No. R-402.3a.

Section R-702.10, Page 108. Revise section to read as follows (R83-92):

R-702.10 Roof Tie-Down: Roof assemblies subject to wind uplift pressures of 20 pounds per square foot or greater, as established in Table No. R-201.2 shall have rafter or truss ties provided in accordance with Table No. R-702.10, or shall be designed in accordance with ASCE 7, listed in Section S-26.702. Roof assemblies subject to wind uplift pressures greater than 50 pounds per square foot shall be designed in accordance with ASCE 7, listed in Section S-26.702. The resulting uplift forces from the rafter or truss ties shall be transmitted to the foundation.

Section R-703, page 109. Revise section to read as follows (R84-92, R127-93, R133-93):

**SECTION R-703—PLYWOOD
AND WOOD STRUCTURAL PANELS**

R-703.1 Identification and grade: Plywood and wood structural panels shall conform to DOC PS 1 or DOC PS 2 listed in Section S-26.703, and shall be identified by grade mark or certificate of inspection issued by an approved agency. Plywood and wood structural panels shall comply with the grades specified in Table No. R-606.1a.

All plywood, when designed to be exposed in outdoor applications, shall be of an exterior type. Plywood or wood structural panel roof sheathing exposed to the underside may be of interior type bonded with exterior glue, identified as Exposure 1.

The allowable unit stresses for fire-retardant-treated plywood, including fastener values, shall be developed from an approved method of investigation which considers the effects of anticipated temperature and humidity to which the fire-retardant plywood will be subjected, the type of treatment and redrying process. The fire-retardant-treated plywood shall be graded by an approved agency.

Wood structural-use panels conforming to DOC PS 2 includes performance rated plywood, oriented strandboard and composite panels. Oriented strandboard structural-use panels manufactured in Canada shall conform to CSA 0437.

R-703.2 Allowable spans: The maximum allowable spans for plywood and wood structural panel roof sheathing shall not exceed the values set forth in Table No. R-606.1a.

R-703.3 Installation: Plywood and wood structural panel roof sheathing shall be installed with joints staggered or nonstaggered in accordance with Table Nos. R-402.3a and R-606.1a, or APA E30 listed in Section S-26.703. Where walls are subject to wind pressures of 30 pounds per sq ft or greater, as determined in Table R-201.2, plywood and wood structural panel roof sheathing shall be attached to the gable end with 8d common nails spaced at no more than 4 inches, or equivalent fasteners.

Table R-704.2, page 109. Revise table to read as follows (R85-92):

Table No. R-704.2
ALLOWABLE LOADS FOR
PARTICLEBOARD ROOF SHEATHING^{1, 2, 4}

GRADE	THICKNESS	MAXIMUM ON CENTER SPACING	LIVE LOAD (Pounds Per Square Foot)	TOTAL LOAD (Pounds Per Square Foot)
2-M-W	7/16 ³	24	30	40

(No change to remainder of table or footnotes)

Section R-704.3, page 109. Revise section to read as follows (R134-93):

R-704.3 Installation: Particleboard roof sheathing shall be installed in accordance with Table Nos. R-402.3a and R-704.2. Where walls are subject to wind pressures of 30 pounds per sq ft or greater, as determined in Table R-201.2, particleboard roof sheathing shall be attached to the gable end with 8d common nails spaced at no more than 4 inches, or equivalent fasteners.

Section 705, page 110. Revise section to read as follows (R86-92):

SECTION R-705—METAL

R-705.1 General: Elements shall be straight and free of any defects which would significantly affect their structural performance.

R-705.2 Steel elements: Structural steel elements shall be designed and constructed in accordance with the AISC-ASD or AISC-LRFD specification listed in Section S-26.705. Cold-formed steel structural elements shall be designed and constructed in accordance with the AISI-ASD or AISI-LRFD specifications listed in Section S-26.705.

R-705.3 Aluminum elements: Aluminum structural elements shall be constructed of materials and designed in accordance with AA SAS30 listed in Section S-26.705.

Chapter 8

Section R-801.3, page 111. Revise section to read as follows (R135-93, R194-93):

R-801.3 Roofing covering materials: Roofs shall be covered with materials as set forth in Sections R-803 through R-810. Roof covering materials shall conform to ASTM A239, A361, B134, B209, B211, B250, B370, C406, and D312; the CSSB "Grading Rules for Wood Shakes and Shingles," UL 55A and AA ASM 35 listed in Section S-26.801. Classified roofing shall conform to UL 790 listed in Section S-26.801 and shall be installed in areas designated by law as requiring their use or when the edge of the roof is less than 3 ft from a property line. The roofing materials set forth in Sections R-804 through R-807 and concrete slabs may be accepted as Class A roofing.

Section R-803.6, page 112. Revise section to read as follows (R136-93):

R-803.6 Side wall flashing: Flashing against a vertical sidewall shall be by the step-flashing method.

Exception: Other methods shall be permitted when installed in accordance with the shingle manufacturer's printed instructions.

Section R-808.1, page 116. Revise section to read as follows (R137-93):

R-808.1 Sheathing requirements: Wood shingles may be applied to roofs with solid or spaced sheathing. Spaced sheathing boards shall be not less than 1 inch by 4 inch nominal dimensions and shall be spaced on centers a distance equal to the actual weather exposure of the shingles, not to exceed the dimensions set forth in Table No. R-808.2b.

Table No. R-808.2a, page 117. Revise table to read as follows (R138-93):

Table No. R-808.2a
WOOD SHINGLE OR SHAKE APPLICATION

ROOF SLOPE	WOOD SHINGLES Not Permitted below 3:12 See Table No. R-808.2b	WOOD SHAKES Not Permitted below 4:12 ¹ See Table No. R-808.2b
DECK REQUIREMENT	Wood shingles shall be applied to roofs having solid or spaced sheathing in accordance with Section R-808.1.	Wood shakes shall be applied to roofs having solid or spaced sheathing in accordance with Section R-809.1.

Section R-809.1, page 120. Revise section to read as follows (R139-93):

R-809.1 Sheathing requirements: Wood shakes shall be applied to roofs with solid or spaced sheathing. Spaced sheathing boards shall not be less than 1 inch by 4 inch nominal dimensions for shakes installed at maximum 7 1/2 inch exposures and shall be spaced on centers a distance equal to the actual weather exposure of the shakes, not to exceed the dimensions set forth in Table No. R-808.2b. For 24 inch shakes used in 10 inch exposure, the spaced sheathing shall be either 1 inch by 4 inch nominal dimension board spaced on centers a distance equal to the weather exposure with an additional 1 inch by 4 inch board placed between these boards, or 1 inch by 6 inch nominal dimension boards spaced on centers a distance equal to the weather exposure. In snow areas, sheathing shall be solid and the shakes shall be applied over an underlayment of not less than No. 15 felt, applied as required in Section R-802.

Section R-810, page 120. Add a new section as follows (R140-93):

SECTION R-810—REROOFING

R-810.1 General: Materials and methods used for repair, replacement or recovering an existing roof shall comply with Sections R-116 and R-801.1. When the repair replacement or recovering within any 12 month period exceeds 25 percent of the roof covering of the building, the entire roof covering shall comply with the requirements for new roofing.

R-810.2 Structural and Construction Loads: The existing roof system shall be capable of supporting all equipment loads encountered during installation as well as the loads resulting from the new roofing materials.

R-810.3 Recovering vs. replacement: New roof covering shall not be installed without first removing existing roof coverings when any of the following conditions occur:

1. When the existing roof or roof covering is water soaked or deteriorated to the point of being unacceptable as a base for additional roofing.
2. When the existing roof covering is wood shake, slate, clay or cement tile; except when the new roof covering is installed in accordance with approved industry standards.
3. When the existing roof has three or more layers of any type of roofing

Exception: The removal of existing roof coverings shall not be required where complete and separate roofing systems are provided which transmit all roof loads directly to the structural system of the building and which do not bear upon the existing roof.

R-810.4 Reinstallation of materials: The reinstallation of existing roof covering materials which have been removed is not permitted unless the materials provide an effective barrier against the weather.

R-810.5 Flashings: Flashings shall be reconstructed in accordance with approved manufacturers instruction.

Chapter 9

Section R-901.12, page 122. Delete existing section and substitute the following (R142-93):

R-901.12 Masonry chimney cleanout openings: Cleanout openings shall be provided within 6 inches of the base of every masonry chimney.

Exception: Chimneys serving masonry fireplaces.

Section R-901.13, page 122. Delete existing section and substitute the following (R143-93):

R-901.13. Chimney clearances: Any portion of a masonry chimney located in the interior of the building or within the exterior wall of the building shall have a minimum airspace clearance to combustibles of 2 inches (51 mm). Chimneys located entirely outside the exterior walls of the building, including chimneys that pass through the soffit or cornice, shall have a minimum airspace clearance of 1 inch (25 mm). The airspace shall not be filled, except to provide firestopping in accordance with Section R-901.14.

Exception: Masonry chimneys equipped with a chimney lining system tested and labeled for use in chimneys in contact with combustibles in accordance with UL 1777 listed in Section S-26.901, and installed in accordance with the manufacturer's installation instructions, are permitted to have combustible material in contact with their exterior surfaces. However, this shall not eliminate the requirement for noncombustible firestopping in accordance with Section R-901.14.

Section R-903.1, page 123. Revise section to read as follows, add 2 sections and renumber existing R-903.2 thru R-903.8 (R144-93):

R-903.1 Fireplace support: Fireplace foundations and supporting walls shall be designed, anchored, supported and reinforced as required in this chapter and the applicable provisions of Chapters 2 and 3. When a design is not provided, foundations for masonry fireplaces and their chimneys shall be constructed of concrete or solid masonry at least 12 inches thick and extend at least 6 inches beyond the fireplace supporting wall on all sides. Footings shall be founded on natural

undisturbed earth or engineered fill below frost depth. In areas not subjected to freezing, footings shall be at least 12 inches below finished grade.

R-903.2 Seismic reinforcing: Unless a specific design is provided, every masonry or concrete chimney in Seismic Zones No. 3 and 4 extending more than 7 ft above the last contact with the structure, shall be reinforced. Reinforcing shall conform to the requirements set forth in Table No. R-903.1. Where the width of the chimney exceeds 40 inches, 2 additional No. 4 vertical bars shall be provided for each additional flue incorporated in the chimney or for each additional 40 inches in width or fraction thereof.

R-903.3 Seismic anchorage: In Seismic Zones Nos. 3 and 4, all masonry and concrete chimneys shall be anchored at each floor ceiling or roof line more than 6 ft above grade, except when constructed completely within the exterior walls. Anchorage shall conform to the requirements set forth in Table No. R-903.1.

(Renumber existing sections 903.2 through 903.8)

Section R-903.5, page 126. Revise section to read as follows (R145-93):

R-903.5 Hearth extension material: Hearth extensions shall be of masonry or concrete at least 2 inches thick and supported by noncombustible materials and reinforced to carry its own weight and all imposed loads. The hearth extension shall be readily distinguishable from the surrounding floor. Combustible forms and centers used during the construction of the hearth extension shall be removed after the construction is complete.

Exception: When the bottom of the firebox opening is raised at least 8 inches above the top of the hearth extension, a hearth extension of not less than 3/8 inch thick brick, concrete, stone, tile or other approved noncombustible material may be used.

Section R-903, page 126. Add new section to read as follows (R142-93):

R-903.10 Ash dump cleanout: Cleanout openings, when provided, shall be equipped with ferrous metal doors and frames constructed to remain tightly closed, except when in use. Cleanouts shall be accessible and so located that ash removal will not create a hazard to combustible materials.

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Part IV, pages 129-196. Revise Part IV by adding the words “listed and” before “labeled” or “listing and” before “label” in the following sections (R87-92):

M-1001.2	M-1402.3	Table M-1704.1
M-1005	M-1403.3	M-1705.1
M-1006.1		M-1705.4
M-1007.1	M-1601	M-1705.5
M-1007.2	M-1601.3	M-1706.3
M-1007.3	M-1601.4	M-1706.6
M-1010	M-1602.2.2	M-1707.7
	M-1602.3	M-1710.1
M-1101.1.6	M-1603.2	
M-1101.4.2	M-1603.4	M-1802.3
M-1101.5.1	M-1603.4.1	M-1804.1
M-1102.2.6	M-1603.4.2	
M-1102.2.7	Table M-1603.4.5	M-1901.3
	M-1603.4.6	M-1901.4
M-1201	M-1604.1	M-1902.1
M-1202.1	Table M-1604.1	M-1902.2
M-1202.3	M-1604.3	M-1903
M-1203.1	M-1604.3.1	M-1904.1
M-1203.2	M-1604.3.2	M-1904.2
M-1203.3	M-1605.2	M-1905
		M-1906.2
M-1301.2		M-1906.3
M-1302.1		M-1907.1
		M-1909.2
		M-1910.3.2

Chapter 10

Section M-1001.3, page 129. Revise section to read as follows (R147-93):

M-1001.3 Conformity: Conformity with the applicable provisions and standards specified in each section of Part IV shall indicate that the equipment is safe for installation under this code. Where differences occur between the provisions of this code and referenced standards, the provisions of this code shall apply. Gas equipment listed to and installed in accordance with the standards specified in NFPA 54/ANSI Z223.1, as listed in Section S-26.1001, shall be permitted.

Section M-1001.4, page 129. Revise section to read as follows (R88-92):

M-1001.4 Authority to disconnect utilities in emergencies: The building official shall have the authority to order disconnected any fuel supply or appliance that does not conform to this code, gas utility service, or energy supplies to a building, structure, premises or equipment regulated by this code in case of emergency where necessary to eliminate an immediate hazard to life or property. A notice shall be attached to the energy supply or appliances stating the reason for disconnection. Such notices shall not be removed nor shall the system or appliance be reconnected until authorized by the building official.

Section M-1002.2, page 129. Revise section to read as follows (R89-92):

M-1002.2 Fuel-burning appliances: The label for fuel-burning appliances, except wood stoves and fireplaces, shall also indicate:

1. The type of fuel approved for use with the appliance.
2. The input or output ratings.
3. Instructions for the lighting operation and shut off of the appliance.

Section M-1002.3, page 130. Revise section to read as follows (R90-92):

M-1002.3 Other than fuel-burning appliances: The label for other than fuel-burning appliances shall also indicate:

1. The output rating in Btu/h or kw.
2. The electrical rating in volts, amperes (or water) and, for other than single phase, the number of phases.
3. The electrical rating in volts, amperes or watts of each field-replaceable electrical component.
4. Amount and type of refrigerant, and factory test pressures or pressures applied for heat pumps and refrigeration cooling equipment.

Section M-1003, page 130. Revise section to read as follows (R91-92, R92-92):

SECTION M-1003—TYPE OF FUEL

Each appliance shall be designed for use with the type of fuel to which it is connected. Appliances shall not be converted from fuel specified on the rating plate for use with a different fuel without securing reapproval from the building official and as recommended by the manufacturer of either the original equipment or the conversion equipment. The serving gas supplier may convert appliances in accordance with procedures approved by the building equipment. The serving gas supplier may convert appliances in accordance with procedures approved by the

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building official without securing reapproval of the appliance if properly relabeled. Conversion burners shall conform to ANSI Z21.17 or ANSI/UL 196 as listed in Section S-26.1003. Gas conversion burners shall be installed in accordance with ANSI Z21.8 listed in Section S-26.1003.

Section M-1006.3, pages 133-134. Revise section to read as follows (R94-92):

M-1006.3 Appliances located in garage: Heating and cooling appliances located in a garage shall be protected from impact by automobiles. Appliances that generate a glow, spark or flame capable of igniting gasoline vapors and located in a garage shall be installed with burners, burner ignition devices or heating elements and switches at least 18 inches above the floor level. Where such appliances are enclosed in a separate compartment having access only from outside of the garage such appliances may be installed at floor level, provided that the required combustion air is taken from and discharged to the exterior of the garage.

Section M-1008, page 134. Revise section to read as follows (R95-92):

SECTION M-1008—EXISTING MECHANICAL SYSTEMS

Additions, alterations, repairs or replacement may be made to any mechanical system without requiring the existing mechanical system to comply with all the requirements of this code, provided the addition, alteration, repair or replacement conforms to that required for a new mechanical system. Additions, alterations, repairs or replacement shall not cause an existing system to become unsafe, create unhealthy or overload conditions.

Section M-1009, page 135. Delete section without substitution (R96-92)

Section M-1010, page 138. Delete the following definition without substitution (R105-92, R107-92):

Hybrid pressure gas supply systems: Deleted.
Listed: Deleted.

Section M-1010, page 135-140. Add the following definitions to read as follows (R98-92, R100-92, R101-92, R102-92, R103-92, R104-92, R108-92, R109-92, R110-92, R111-92, R112-92, R115-92):

Btu/h: The listed maximum capacity of any appliance, absorption unit or burner expressed in British thermal units input per hour, unless otherwise noted.

Refrigerant Compressor: A specific machine with or without accessories, for compressing a given refrigerant vapor.

Confined space: A room or space having a volume less than 50 cubic ft. per 1000 Btu/h of the aggregate input rating of all fuel-burning appliances installed in that space.

Flue, appliance: The passages within an appliance through which combustion products pass from the combustion chamber to the flue collar.

Gas pressure regulator: see Regulator.

Heat Pump: An appliance having heating or heating/cooling capability and which uses refrigerants to extract heat from air, liquid or other sources.

Listed and Listing: Terms referring to equipment which is shown in a list published by an approved testing agency qualified and equipped for experimental testing and maintaining an adequate periodic inspection of current productions and whose listing states that the equipment complies with nationally recognized standards when installed in accordance with manufacturer's installation instructions.

Low-pressure gas supply system: A gas supply system with gas pressure at or below 0.5 psig.

Medium-pressure gas supply systems: A gas supply system with gas pressure exceeding 0.5 psig but not exceeding 5 psig.

Regulator vent: The opening in the atmospheric side of the regulator housing permitting the movement of air to compensate for the movement of the regulator diaphragm.

Service piping: The piping and equipment between the street gas main and the gas-piping system inlet, which is installed by and is under the control and maintenance of the serving gas supplier.

Unusually tight construction: Construction where:

- A. Walls and ceilings exposed to the outside atmosphere have a continuous water vapor retarder with a rating of one perm or less with openings gasketed or sealed, and
- B. Weatherstripping has been added on openable windows and doors, and
- C. Caulking or sealants are applied to areas such as joints around window and door frames between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings.

Water heater: A closed vessel in which water is heated by the combustion of fuels, electricity or any other source and withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210 degrees F.

Chapter 11

Section M-1101.1.3, page 141. Revise section to read as follows (R118-92):

M-1101.1.3 Heating and cooling equipment room installations:

When equipment is located in an equipment room, the room shall have an opening or door that is large enough to permit removal of the largest piece of equipment, but not less than 20-inches wide. An unobstructed working space not less than 30-inches wide and not less than 30-inches high shall be provided along the control side of the equipment when the door of the equipment room is open.

Section M-1101.2.1, page 142. Revise section to read as follows (R121-92):

M-1101.2.1 General: Warm air furnaces shall conform to the applicable ANSI Standards Z21.47, Z21.64 or ANSI/UL 727 as listed in Section S-26.1101. Fuel burning warm air furnaces shall not be installed in a room designed to be used as a storage closet. Furnaces located in a bedroom or bathroom shall be installed in a sealed enclosure such that combustion air will not be taken from the living space. Direct vent furnaces are not required to be installed within an enclosure.

Section M-1101.2.2, page 142. Revise section to read as follows (R123-92):

M-1101.2.2 Clearances: Clearances shall be provided for warm-air furnaces in accordance with Table No M-1005a or in accordance with the manufacturers installation instructions.

Section M-1101.2.4, page 142. Revise section to read as follows (R125-92):

M-1101.2.4 Electric furnaces: Electric furnaces shall be installed in accordance with UL 1096 as listed in Section S-26.1101 of this code.

M-1101.3.1, page 142. Revise section to read as follows (R126-92):

M-1101.3.1 Heating elements: Heat pump equipment utilizing supplemental electric heating elements shall have such elements installed in accordance with U.L. 559 as listed in Section S-26.1101 of this code.

Section M-1101.4.3, page 143. Revise section to read as follows (R127-92):

M-1101.4.3 Condensate disposal: A condensate drain shall be provided to dispose of condensate from the cooling coil. Condensate

drains shall terminate outside of the building, or to a floor drain, plumbing fixture, sump or other approved location.

Where the cooling coil or air conditioning unit is located indoors above a living space, a water-tight pan of corrosion-resistant metal shall be installed beneath the unit to catch overflow condensate due to a clogged condensate drain. The pan shall be provided with a drain pipe of minimum $\frac{3}{4}$ -inch nominal pipe size which discharges at a conspicuous location to indicate that the regular drain is clogged.

Section M-1102.1, page 144. Revise #2 to read as follows (R129-92):

2. Underground duct systems shall be constructed of approved concrete, clay, metal, plastic or other approved materials. The maximum duct temperature for plastic ducts shall be not greater than 150°F. Plastic pipe and fittings shall conform to cell classification 12454-B of ASTM D1248 or ASTM D1784, as listed in Section S-26.1102, and external loading properties of ASTM D2412, as listed in Section S-26.1102.

Section M-1102.1.1, page 144. Revise section to read as follows (R130-92):

M-1102.1.1 Factory-made ducts: Factory-made air ducts or duct material shall be approved for the use intended, and shall be installed in accordance with the manufacturer's installation instructions. Each portion of a factory-made air duct system shall bear a label or mark indicating compliance with UL 181 and UL 181A, as listed in Section S-26.1102.

Section M-1102.2.8, page 146. Add new section to read as follows (R148-93):

M-1102.2.8 Metal Duct Separation: Metal ducts shall be installed with at least 4 inches separation from earth unless protected in an approved manner.

Section M-1102.3, page 146. Revise section to read as follows (R131-92):

M-1102.3 Under-floor plenums: An under-floor space used as a supply plenum shall conform to the requirements of this section. Fuel gas lines and plumbing waste clean outs shall not be located within the space.

Section M-1103.1, page 146. Revise section to read as follows (R132-92):

M-1103.1 Return air: Return air shall be taken from inside the dwelling, but may be diluted with outdoor air.

Chapter 13

Table No. M-1304.1, page 153. Revise table to read as follows (R194-93):

**Table No. M-1304.1
HYDRONIC PIPING MATERIALS**

(Remainder of table unchanged)

MATERIAL	USE CODE ¹	STANDARD	JOINTS	NOTES
Copper Tubing (Type K, L, or M)	1, 2	ASTM B75, B88, B251, B306	Brazed, soldered, flared mechanical fittings	Joints embedded in concrete
Soldering Fluxes	1	ASTM B813	Copper Tube Joints	

Chapter 14

Section M-1401.1, page 155. Revise section to read as follows (R133-92):

M-1401.1 General: Vented floor furnaces shall conform to ANSI Z21.48 or ANSI/UL 729 as listed in Section S-26.1401 and shall be installed in accordance with the manufacturer's installation instructions and the requirements of the code.

Section M-1401.2, page 155. Revise section to read as follows (R134-92):

M-1401.2 Clearances: Vented floor furnaces shall be installed in accordance with their listing or Table No. M-1005a unless otherwise approved.

Section M-1401.3, page 155. Revise #3 to read as follows (R135-92):

3. The furnace register shall be located not less than 12 inches from doors in any position, draperies, or similar combustible objects.

Section M-1401.5, page 155. Revise #1 to read as follows (R137-92):

1. Thermostats controlling floor furnaces shall be located in the room in which the register of the floor furnace is located.

Section M-1401.5, page 155. Revise #4 to read as follows (R138-92):

4. When excavation is required for a floor furnace installation, the excavation shall extend 30 inches beyond the control side of the floor furnace and 12-inches beyond the remaining sides. Excavations shall slope outward from the perimeter of the base of the excavation to the surrounding grade at an angle not exceeding 45 degrees from horizontal.

Section M-1402.1, page 156. Revise section to read as follows (R139-92):

M-1402.1 General: Vented wall furnaces shall conform to ANSI Z21.44, Z21.49 or ANSI/UL 730 as listed in Section S-26.1402 and shall be installed in accordance with manufacturer's installation instructions and the requirements of this code.

Section M-1403.1, page 156. Revise section to read as follows (R140-92):

M-1403.1 General: Vented room heaters shall conform to ANSI Z21.11.1, UL 1482, or UL 896 as listed in Section S-26.1403, and shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code.

Section M-1403.2, page 156. Revise section to read as follows (R141-92, R142-92):

M-1403.2 Clearances: Vented room heaters shall be installed in accordance with their listing, or Table No. M-1005a unless otherwise approved.

Section M-1403.5, page 156. Revise section to read as follows (R143-92):

M-1403.5 Solid fuel burning heaters: Solid fuel burning heaters installed in garages shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code.

Chapter 15

Section M-1501.1, page 157. Revise section to read as follows (R144-92):

M-1501.1 Air supply: Fuel burning equipment shall be provided with a sufficient supply of air for fuel combustion, draft hood dilution and ventilation of the space in which the equipment is installed. The methods of providing combustion air in this chapter do not apply to direct vent appliances, appliances listed as having separated combustion systems, enclosed furnaces, listed cooking appliances, refrigerators and domestic clothes dryers.

In buildings of unusually tight construction, combustion air shall be obtained from outside the sealed thermal envelope. In buildings of ordinary tightness insofar as infiltration is concerned, all or a portion of the combustion air for fuel burning appliances may be obtained from infiltration when the room or space has a volume of 50 cu. ft. per 1000 Btu/h input.

Section M-1501.2, page 157. Revise section to read as follows (R146-92):

M-1501.2 Exhaust and ventilation system: Air requirements for operation of exhaust fans, kitchen ventilation systems, clothes dryers, and fireplaces shall be considered in determining the adequacy of a space to provide combustion air. Air requirements determined in accordance with Sections (7) through (14) of Appendix H of NFiPA 54/ANSI Z223.1, as listed in Section S-26.1708, are acceptable.

Section M-1502, page 157. Revise section heading to read as follows (R147-92):

SECTION M-1502 ALL AIR FROM INSIDE THE BUILDING

Section M-1502.3, page 157. Revise section to read as follows (R148-92):

M-1502.3 Unusually tight construction: (No change to existing text).

Section M-1503, page 158. Revise section to read as follows (R149-92):

SECTION M-1503 ALL AIR FROM OUTDOORS

M-1503.1 Outdoor air: When the space in which fuel burning appliances are located does not meet the criterion for indoor air specified in Section M-1502, outside combustion air shall be supplied through openings or ducts, as illustrated in Figures No. M-1503.1, No. M-1503.3, and No. M-1503.4. One opening shall be within 12 inches of the top of the enclosure, and one within 12 inches of the bottom of the enclosure. Openings are permitted to connect to spaces directly communicating with the outdoors, such as ventilated crawl spaces or ventilated attic spaces. The same duct or opening shall not serve both combustion air openings. The duct serving the upper opening shall be level or extend upward from the appliance space.

Section M-1503.3, page 158. Revise section to read as follows and add figure (R150-93):

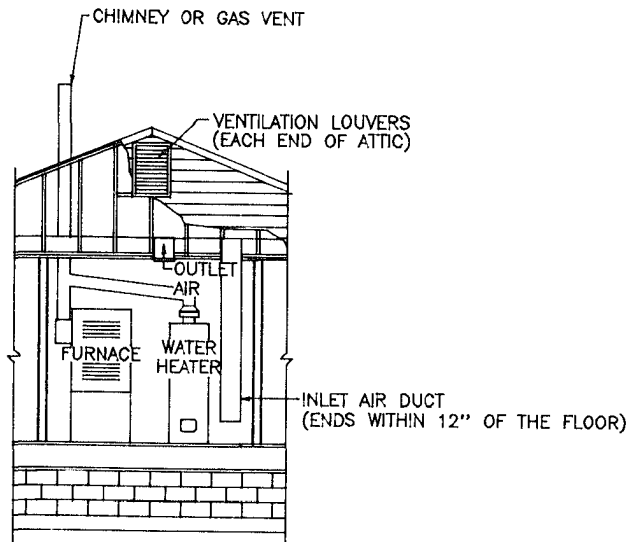
M-1503.3 Attic Combustion Air: Combustion air obtained from an attic area, as illustrated in Figure No. M-1503.3.1 shall be in accordance with the following:

1. The attic ventilation shall be sufficient to provide the required volume of combustion air.
2. The combustion air opening shall be provided with a metal sleeve or other approved material extending from the appliance enclosure to at least 6 inches above the top of the ceiling joists and ceiling insulation.

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3. An inlet air duct within an outlet air duct shall be an acceptable means of supplying attic combustion air to an appliance room provided that the inlet duct extends at least 12 inches above the top of the outlet duct in the attic space, as illustrated in Figure No. M-1503.3.2.
4. The end of ducts that terminate in an attic shall not be screened unless required by the building official.

Figure No. M-1503.3.2
EQUIPMENT LOCATED IN CONFINED SPACES
ALL AIR FROM OUTDOORS THROUGH VENTILATED ATTIC
(ALTERNATE METHOD)



NOTE: THE INLET AND OUTLET AIR OPENINGS SHALL EACH HAVE A FREE AREA OF NOT LESS THAN ONE SQUARE INCH PER 4,000 Btu/h OF TOTAL INPUT RATING OF ALL EQUIPMENT IN THE ENCLOSURE.

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Section M-1504.2, page 161. Revise section to read as follows (R150-92):

M-1504.2 Openings and supply ducts: Two openings for ventilation shall be located and sized in accordance with Section M1502.2. In addition, there shall be one opening directly communicating with the outdoors or to such spaces (crawl space or attic) that freely communicates with the outdoors. This opening shall have free area of at least 1-square inch per 5000 Btu/h of total input of all appliances in the space. Ducts shall be of the same minimum cross-sectional area as the required free area of the opening. Ducts admitting outdoor air may be connected to the return air side of the heating system.

Chapter 16

Section M-1601.2, page 163. Revise section to read as follows (R152-92):

M-1601.2 Inspection of chimneys: Before connecting a vent connector to a chimney, the chimney passageway shall be clean and free of obstructions. When inspection reveals that an existing chimney is not safe for the intended application, it shall be rebuilt to conform to Sections R-901 and R-902, lined or relined with a suitable liner, or replaced with a vent or chimney suitable for the equipment to be attached.

Section M-1603.2, page 164. Revise section to read as follows (R151-93):

M-1603.2 Connectors for gas appliances: Connectors for labeled gas appliances and appliances equipped with a labeled gas burner and draft hood shall be of Type B or Type L vent material, or single-wall metal pipe. The minimum nominal thickness of a single-wall vent connector shall be 0.019 inch (No. 28 Gage) for galvanized steel, 0.022 inch (No. 26 B & S Gage) for copper, and 0.020 inch (No. 24 B & S Gage) for aluminum. Connectors for Category II, III and IV equipment shall be as specified by the equipment manufacturer.

Chapter 17

Section M-1701, page 177. Revise section to read as follows (R157-92):

SECTION M-1701 GENERAL

The requirements of this chapter shall govern the installation of fuel-gas piping in or in connection with a building or structure or within the property lines of premises, other than service piping.

For private individual LPG systems the point of delivery is the outlet of the first stage pressure regulator. For all other fuel gas supply systems, the point of delivery is the outlet of the gas service meter.

Section M-1702, page 177. Revise section to read as follows (R158-92, R159-92):

SECTION M-1702 AUTHORITY TO RENDER GAS SERVICE

A serving gas supplier, or person furnishing gas shall not turn on, or cause to be turned on, fuel gas or gas meters, until approval of rough piping inspection, in compliance with Section M-1703.2.1.

Gas service shall not be rendered until approval by final inspection in compliance with Section M-1703.2.2. Temporary gas service shall be permitted upon approval of rough inspection of the equipment to be served.

Section M-1703, page 177. Add new section to read as follows. Renumber existing M-1703 through M-1711 (R161-92):

SECTION M-1703 INSPECTIONS

M-1703 General: Upon completion of installation, alteration, repair or replacement of gas piping, and prior to the use thereof, the building official shall be notified that gas piping is ready for inspection.

M-1703.1 Accessibility for inspection: Excavations required for the installation of underground piping shall be kept open until such time as the piping has been inspected and approved. If piping is covered or concealed before approval, it shall be exposed upon the direction of the building official.

M-1703.2 Required inspections: The building official shall make the following inspections and shall either approve that portion of the work as completed, or shall notify the permit holder wherein the same fails to comply with this chapter.

M-1703.2.1 Rough piping inspection: This inspection shall be made after gas piping authorized by the permit has been installed and before such piping has been covered or concealed or a fixture or appliance has been attached thereto. This inspection shall include a determination that the gas piping size, material and installation meet the requirements of this chapter. It shall also include an air, CO₂ or nitrogen pressure test, at which time the gas piping shall stand a pressure of not less than 10 pounds per square inch gage, or, at the discretion of the building official, the piping and valves may be tested at a pressure of at least 6 inches mercury, measured with a manometer or slope gauge. Test pressures shall be held for a length of time satisfactory to the building official, but not less than 15 minutes, with no perceptible drop in pressure. For welded piping, and for piping carrying gas at pressures exceeding 14 inches water column pressure, the test pressure shall be at least 60 pounds per square inch but not less than 30 minutes. These tests shall be made in the presence of the building official. Necessary apparatus for conducting tests shall be furnished by the permit holder

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M-1703.2.2 Final piping inspection: This inspection shall be made after piping authorized by the permit has been installed and after all portions thereof which are to be covered or concealed are so concealed and after all fixtures, appliances and shutoff valves have been attached thereto.

The building official may require, at his discretion, an additional air pressure test, as described in Section M-1703.2.1, if it is observed that alterations or additions to the previously tested and approved piping have occurred following the rough piping inspection approval.

M-1703.3 Other inspections: In cases where the work authorized by the permit consists of a minor installation of additional piping to piping already connected to a gas meter, the foregoing inspection may be waived at the discretion of the building official. The building official shall make such inspections as he deems advisable in order to assure that the work has been performed in accordance with the intent of this chapter.

Table M-1704.1, page 178. Revise table to read as follows (R162-92):

Table No. M-1704.1
GAS SUPPLY PIPING MATERIALS

MATERIAL	STANDARD	APPROVED JOINTS	NOTES
Black Steel	ASTM A53, A106	Welded, Threaded, Flanged	Schedule 40 pipe, malleable black or galvanized fittings only. protect in accordance with Section M-1707.1.2 if outside below grade.
Galvanized Steel pipe	ASTM A53	Thread or Flanged	Schedule 40 pipe, malleable black fitting only. Protect in accordance with Section M-1707.1.2 if outside below grade.
Corrugated Stainless Steel Tubing	ANSI/AGA LC 1	Proprietary Mechanical Fittings	Labeled system. Install per manufacturer's installation instructions. Above grade use only.
Soft Copper, Type K or L Tubing ²	ASTM B75, B88, B280, B68	Flared or Brazed	Mark as per Section M-1707.8 when use above grade.
Copper or Brass Pipe ¹	ASTM B42, B43, B302	Threaded or Flared	
Plastic Pipe ¹	ASTM D2513	Solvent Cement, Adhesive, Heat Fusion, Compression Couplings, Flanged	Use only underground, outside of building.

¹Plastic pipe and fittings shall not be used within or beneath a building

²Copper and brass pipe and tubing with the exception of tin lined copper tubing shall not be used if the gas contains an average of 0.3 grains of hydrogen sulfide per 100 standard cubic feet of gas.

Section M-1704.2, page 177. Delete section without substitution. Renumber M-1704.3 (R163-92):

Section M-1705, page 178. Revise section to read as follows (R87-92, R164-92):

M-1705.1 Approved type: Gas valves shall be listed and labeled or approved for fuel gas service and compatible with with gas piping served. Manually operated gas valves shall conform to ANSI Z21.15 or ANSI/ASME B16.33 as listed in Section S-26.1705, or as approved.

Section M-1705.3, page 178. Delete section and substitute the following (R165-92):

M-1705.3 Shut-off valves: An accessible, approved shut-off valve shall be installed in the fuel-gas piping outside of each appliance and ahead of the union connection thereto in addition to any valve provided on the appliance. Such valve shall be within 6 ft. of the appliance it serves, and in the same room or space where the appliance is located.

Shut-off valves may be accessibly located inside or under an appliance when such appliance can be removed without removal of the shut-off valve.

Shut-off valves may be accessibly located inside wall heaters and wall furnaces listed for recessed installations where necessary maintenance can be performed without removal of the shut-off valve.

Section M-1706.6, page 180. Revise section to read as follows (R166-92):

M-1706.6 Appliance connection: Gas appliances and equipment shall be connected to the building piping by rigid metallic pipes, semi-rigid metallic tubing, or a labeled gas appliance connector having a diameter not less than the nominal inlet connection to the appliance in accordance with their label. Labeled metal appliance connectors shall have an overall length not to exceed 3 ft., except range and domestic clothes dryer connection, which may not exceed 6 ft., in length. Connectors shall not be concealed within or extended through walls, floors or partitions. The connection of an indoor appliance with any type of gas hose is prohibited. Outdoor portable appliances may be connected with an approved outdoor hose connector not to exceed 15 ft. in length, provided it connects outdoors to approved gas piping including an approved valve at the inlet of the hose connector. Appliances may be connected to fuel gas piping with an approved listed quick disconnect device.

Section M-1707.1.6, page 180. Revise section to read as follows (R167-92):

M-1707.1.6 Tracer for nonmetallic buried piping: A minimum No. 18 AWG insulated copper tracer wire or other approved conductor shall be installed adjacent to underground nonmetallic gas piping and shall be accessible or terminate above grade at each end.

Section R-1707.2.2, page 181. Revise section to read as follows (R153-93):

M-1707.2.2 Sediment Trap: If a sediment trap is not incorporated as a part of the gas utilization equipment, a sediment trap shall be installed as close to the inlet of the equipment as practical, downstream of the shutoff valve. The sediment trap shall be either a tee fitting with a capped nipple in the bottom outlet or other device recognized as an effective sediment trap. Ranges, clothes dryers, and outdoor grills need not be so equipped.

Section R-1707.2.3, page 181. Revise section to read as follows (R154-93):

M-1707.2.3 Prohibited Locations: Gas piping shall not be run in or through supply and return air ducts, clothes chutes, chimneys, vents, dumbwaiters, or elevator shafts. This provision shall not apply to ducts used to provide combustion air in accordance with Chapter 15. Valves and unions shall not be located in any air plenum.

Section M-1707.6 page 182. Revise section to read as follows (R155-93):

M-1707.6 Purging: The fuel-gas piping system shall be purged in accordance with NFPA 54/ANSI Z223.1 listed in Section S-26.1707 prior to placing in service. Piping shall not be purged into the combustion chamber of an appliance.

Section M-1708.1, page 183. Revise section to read as follows (R169-92):

M-1708.1 Required gas supply: All fuel-gas pipe shall be sized to supply the required demand of the attached appliances. The cu. ft. per hour of gas required shall be obtained by dividing the specified Btu/h of an appliance by the average Btu heating value per cu. ft. of gas being supplied. Where the rating of the gas appliance to be installed has not been specified, Table No. M-1708.1 or other approved sources shall be permitted to estimate the requirement in Btu/h.

Table M-1708.2, page 184. Revise table heading to read as follows (R170-92):

Table No. M-1708.2
MAXIMUM CAPACITY OF PIPE AND SMOOTH WALLED
TUBING IN CUBIC FEET OF GAS PER HOUR
FOR A GAS PRESSURE OF 6 INCH WATER COLUMN
AND A PRESSURE DROP OF 1 INCH WATER COLUMN
(Based on 0.60 Specific Gravity Gas)

Section M-1709, page 184. Revise section M-1709 heading and M-1709.1 to read as follows (R171-92):

SECTION M-1709 MEDIUM-PRESSURE PIPING SYSTEM

M-1709.1 Medium-pressure piping size: Two psig medium-pressure systems shall be sized according to Table No. M-1709.1, or in accordance with NFiPA 54/ANSI Z223.1, listed in Section S-26.1709 or by other approved methods. Systems designed for medium pressures other than 2 psig shall be sized in accordance with NFiPA 54/ANSI Z223.1.

Table M-1709.1, page 184. Revise table heading to read as follows (R172-92):

**Table No. M-1709.1
MAXIMUM CAPACITY OF PIPE AND SMOOTH WALLED
TUBING IN CUBIC FEET OF GAS PER HOUR
FOR A GAS PRESSURE OF 2 PSIG AND
A PRESSURE DROP OF 1½ PSIG
(Based on 0.60 Specific Gravity Gas)**

Section M-1709.2, page 184. Revise section to read as follows (R173-92):

M-1709.2 Gas pressure regulators: Pounds-to-inches regulators installed between the medium-pressure and low-pressure systems shall have full lock-up capability to maintain reduced pressure under static load conditions with no gas flowing, and shall be rated for the pressure of the system. Regulators shall be accessible for inspection and maintenance.

Section M-1711, page 186. Delete section M-1711.1, M-1711.2, M-1711.3, M-1711.4, and M-1711.5 without substitution (R174-92).

Chapter 18

Section M-1801.1, page 187. Revise section to read as follows (R156-93):

M-1801.1 Materials: Fuel oil supply tanks shall be fabricated from steel or other approved materials. Steel tanks shall conform to UL 80, UL 142 or UL 443 listed in Section 26.1801. All shop-fabricated supply tanks shall bear the label of an approved agency.

Section M-1803.7, page 188. Revise section to read as follows (R177-92):

M-1803.7 Corrosion protection: Underground tanks and buried piping

shall be protected by corrosion resistant coatings, special alloys, fiberglass reinforced plastic or other approved systems or an engineered cathodic protection system.

Chapter 19

Section M-1901.1, page 191. Revise section to read as follows (R178-92):

M-1901.1 Clearances: Freestanding or built-in ranges shall have a vertical clearance above the cooking top of not less than 30 inches to unprotected combustible material. When the underside of such combustible material is protected with non-combustible material or a metal ventilating hood, the distance shall not be less than 24 inches. The minimum horizontal distance from the center of the burner heads of a top (or surface) cooking unit to surrounding combustible material shall be not less than that distance specified by its listing.

Section M-1901.4, page 191. Revise section to read as follows (R179-92):

M-1901.4 Range hoods: Range hoods shall be vented to the outdoors by a single-wall duct constructed of galvanized steel, stainless steel, copper or other material approved by the building official for the use intended. The duct serving the hood shall have a smooth interior surface, be substantially airtight and shall be equipped with a back-draft damper. Vents serving range hoods shall not terminate in an attic or crawlspace or any area inside the building. Labeled unvented range hoods shall be installed in accordance with the terms of their listing.

Section M-1901.5 page 191. Add a new section to read as follows (R157-93):

M-1901.5 Installation of listed/labeled microwave oven over a listed/labeled cooking appliance: The installation of a listed/labeled cooking appliance or microwave oven over a listed/labeled cooking appliance shall conform to the terms of the upper appliance's listing/label and the manufacturer's instructions.

Section M-1904.1, page 192. Revise section to read as follows (R181-91):

M-1904.1 General: Clothes dryers shall be listed and labeled and shall be installed in accordance with the manufacturer's installation instructions. Gas clothes dryers shall conform to ANSI Z21.5.1, as listed in Section S-26.1904.

Section 1904.3, page 192. Revise section to read as follows (R159-93):

M-1904.3 Clothes Dryer Exhaust: Dryer vent systems shall be independent of all other systems and shall convey the moisture to the outdoors. Vents shall not be connected with sheet-metal screws or other fastening means which extend into the vent. Exhaust vents shall be equipped with a back-draft damper. All vents shall be constructed of minimum 0.016-inch thick rigid metal ducts, having smooth interior surfaces with joints running in the direction of air flow. Approved flexible duct connectors may be used in connection with domestic dryer exhausts. Flexible duct connectors shall not be concealed within construction.

Section M-1904.3.2, page 192. Revise section to read as follows (R160-93):

M-1904.3.2 Length Limitation: The maximum length of a 4 inch diameter exhaust vent shall not exceed 25 feet from the dryer location to wall or roof termination, and shall terminate with a full opening exhaust hood. A reduction in maximum length of 2.5 feet for each 45 degree bend and 5 feet for each 90 degree bend shall apply. Installations where this length is exceeded shall be installed in accordance with the manufacturer's installation instructions.

Section M-1905.1, page 192. Revise section to read as follows (R182-92):

M-1905.1 General: Water heaters shall be labeled and shall be installed in accordance with the manufacturer's installation instructions, and conform to ANSI Z21.10.1, ANSI Z21.10.3, or UL 174 as listed in Section S-26.2001.

Water heaters designed to be vented shall be connected to a venting system and such system shall be installed in accordance with Chapter 16.

Water heaters which depend upon the combustion of fuel for the heat shall be provided with a sufficient supply of combustion air and shall be installed accordance with Chapter 15.

Section M-1905.2, page 192. Add new section to read as follows (R183-92):

M-1905.2 Prohibited locations: Fuel-burning water heaters shall not be installed in a room used as a storage closet. Water heaters located in a bedroom or bathroom shall be installed in a sealed enclosure such that combustion air will not be taken from the living space. Direct vent water heaters are not required to be installed within an enclosure.

Section M-1906.3, page 192. Revise section to read as follows (R185-92):

M-1906.3 Gas Logs: Listed and labeled gas logs installed in solid-fuel-burning fireplaces shall be in accordance with the provisions of this section provided:

1. The gas logs are installed only in accordance with their listing and label and manufacturer's installation instructions.
2. If the fireplace is equipped with a damper, it shall be permanently blocked open to prevent spillage of combustion products into the room.
3. The minimum flue passageway shall be not less than 1 square inch per 1000 Btu/h input.
4. Gas logs equipped with a pilot shall have listed and labeled shut-off valve.

Section M-1907.1, page 193. Revise section to read as follows (R186-92):

M-1907.1 Clearances: Gas lights shall be labeled and shall be installed in accordance with the manufacturer's installation instructions.

Chapter 20

Section P-2001.1, page 197. Revise section to read as follows (R188-92):

P-2001.1 Application: The provisions of this part shall establish the general scope of the plumbing system and equipment requirements of this code and the definitions of terms related thereto. The use of materials or methods of construction not specified in this part accomplishing the purposes intended by this code and approved by the building official in accordance with Section R-108 shall be accepted as complying with this code. Plumbing materials and systems shall conform to the provisions of this chapter, Chapters 21 through 25 and the standards specified therein, as applicable, or to the Uniform Plumbing Code, the Standard Plumbing Code, or the National Plumbing Code as adopted by the jurisdiction. The applicant shall declare which plumbing provisions are to apply at the time of application for the permit.

Table No. P2001.1, page 198. Add the following standards to the table as follows (R161-93, R162-93, R176-93, R194-93):

ASTM F876	ASTM D2657
ASTM F1380	ASTM F1290
ASTM B813	

Chapter 22

Table No. P-2202.1, page 214. Revise date of the following standards and add new standards to read as follows (R164-93 and R165-93):

**Table No. P-2202.1
DRAIN, WASTE AND VENT PIPING AND FITTING
MATERIALS¹**

(As listed in Section S-26.2001)

MATERIAL	STANDARD NO.
Revise:	
ABS-DWV Pipe and Fittings	ASTM D2661-91
PVC-DWV Pipe and Fittings	ASTM D2665-91b
ABS Sewer Pipe and Fittings	ASTM D2751-91
Thermo-Plastic Accessible and Replaceable Plastic Tube and Fittings	ASTM F409-91
ABS-DWV SCH. 40 Pipe with Cellular Core	ASTM F628-91
Co-extruded PVC Plastic Pipe with Cellular Core	ASTM F891-91
Add:	
Solvent Cement for ABS-DWV Pipe and Fittings	ASTM D2235-88
Solvent Cement for PVC-DWV Pipe and Fittings	ASTM D2564-91
Socket Bell for PVC-DWV Pipe and Fittings	ASTM D2672-89
Primers for Solvent Cemented PVC-DWV Pipe and Fittings	ASTM F656-89a

Table No. P-2202.2, page 215. Revise date of the following standards and add new standards to read as follows (R191-92, R164-93 and R165-93):

**Table No. P-2202.2
BUILDING SEWER PIPING
(As listed in Section S-26.2001)**

MATERIAL	STANDARD NO.
Revise:	
ABS-DWV Pipe and Fittings	ASTM D2661-91
PVC/DWV Pipe and Fittings	ASTM D2665-91b
ABS Sewer Pipe and Fittings	ASTM D2751-91
ABS Schedule 40 DWV Pipe with Cellular Core	ASTM F628-91
Co-extruded PVC Schedule 40, PS 50 or PS 100 Plastic Pipe with Cellular Core	ASTM F891-91
Practice for Underground Installation of Thermoplastic pipe	ASTM D2321-89
Add:	
Solvent Cement for ABS-DWV Pipe and Fittings	ASTM D2235-88
Solvent Cement for PVC-DWV Pipe and Fittings	ASTM D2564-91
Socket Bell for PVC-DWV Pipe and Fittings	ASTM D2672-89
Primers for Solvent Cemented PVC-DWV Pipe and Fittings	ASTM F656-89a

Section P-2203.3.4, page 216. Revise section to read as follows (R194-93):

P-2203.3.4 Soldered joints: Soldered joints in tubing shall be made with fittings approved for DWV piping. Surfaces to be soldered shall be cleaned bright. The joints shall be properly fluxed and made with approved solder. Fluxes shall conform to ASTM B 813.

Section P-2206.4.1, page 221. Revise section to read as follows (R193-92):

P-2206.4.1 Fixture branch and stack sizing:

1. Branches and stacks shall be sized according to Table No. P-2206.4.1. Below-grade drain pipes shall not be less than 1½ inches in diameter.
2. Minimum Stack Size. Drain stacks shall not be smaller than the largest horizontal branch connected, with the following exceptions:
 - a. A 4-inch by 3-inch closet bend or flange or a 4-inch closet bend into a 3-inch stack tee shall be acceptable (see Section P-2206.1.7).

Section 2206.6.5, page 223. Revise item #2 to read as follows (R166-93):

2. Separate fixture traps with interior partitions, except those lavatory traps made of plastic, stainless steel or other corrosion resisting material.

Section P2206.6.6, page 224. Revise item #4 to read as follows (R167-93):

4. The connection of a laundry tray waste line may be made into a standpipe for the automatic clothes-washer drain. Standpipes shall not be less than 30 inches nor more than 48 inches as measured from the crown weir. The outlet of the laundry tray shall be a maximum horizontal distance of 30 inches from the standpipe trap.

Table P-2206.6.7, page 224. Revise trap sizes for dishwasher (on separate trap) and shower to read as follows (R193-92, R167-93):

**Table No. P-2206.6.7
SIZE OF TRAPS AND TRAP ARMS
FOR PLUMBING FIXTURES**

PLUMBING	TRAP SIZE MINIMUM (inches)
Dishwasher (on separate trap)	1 1/2
Shower	1 1/2
Clothes washer standpipe	1 1/2

Section P-2206.8.1, page 226. Revise section to read as follows (R195-92):

P-2206.8.1 Sewage ejectors or sewage pumps: A sewage ejector, sewage pump, or grinder pump receiving discharge from a water closet shall have minimum discharge velocity of 1.9 feet per second throughout the discharge piping to the point of connection with a gravity building drain, gravity sewer or pressure sewer system. A non-grinding pump or ejector shall be capable of passing a 1½ inch-diameter solid ball, and the discharge piping shall have a minimum diameter of 2 inches. The discharge piping of grinding pumps shall have a minimum diameter of 1¼ inches. All pumps shall be protected from backflow by a backwater or check valve.

P-2206.8.1.1 Sump alarms: Sumps that discharge by means of automatic pumping equipment shall be provided with an approved, electrically operated high water indicating alarm. A remote sensor shall activate the alarm when the fluid level exceeds a preset level that is less than the maximum capacity of the sump. The alarm shall function to provide an audiovisual signal to occupants within the dwelling. Electrical power for the alarm shall be supplied through a branch circuit separate from that supplying the pump motor.

Section P-2207.1.2, page 227. Delete section without substitution. Renumber existing P-2207.1.3 (R197-92, R198-92):

Section P-2207.7, page 227. Delete section and substitute the following (R198-92):

P-2207.7 Dry vent sizing: All dry portions of any venting system including individual and common vents extending from trap arms, stack vents, vent stacks, relief vents or other dry vents shall be sized based on the accumulated load. The diameter of each vent shall be at least ½ the diameter of the required drainage pipe size computed in accordance with Section P-2206.4 except that the vent pipe shall not be less than 1¼ inches in diameter. Where vents exceed 40 feet in length, the vent shall be increased by one nominal pipe size. The developed length shall be measured from the farthest point of the vent connection to the drainage system, to outside the building.

Exceptions:

1. Sump vents, see Section P-2207.10.
2. Engineered vent sizing in accordance with Appendix D.

Section P-2207.8, pages 230. Delete P-2207.8.1 and P-2207.8.2 and substitute the following (R168-93):

P-2207.8.1 Horizontal wet vent: Any combination of fixtures located on the same floor level are permitted to be vented by a horizontal wet vent. The wet vent shall extend from the connection of the dry vent

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along the direction of the flow in the horizontal branch drain to the most downstream wet vented fixture drain connection. The size of the wet vent shall be in accordance with Table No. P-2207.8.1. Each fixture drain being wet vented shall connect independently to the horizontal branch drain. Fixtures that discharge above the elevation of the horizontal branch drain, thereby requiring vertical drain sections, shall be individually or common vented, or shall comply with Section P-2206.7.3 of this code. The dry vent shall be connected between the two most upstream fixtures. See Figure No. P-2207.8.1 and P-2207.8.2 for typical wet vent configurations.

P-2207.8.2 Vertical wet vent: Any combination of fixtures located on the same floor level are permitted to be vented by a vertical wet vent. The vertical wet vent shall extend from the connection of the dry vent down to the lowest fixture drain connection. The size of the wet vent shall be in accordance with Table No. P-2207.8.1. Each fixture drain shall connect independently to the vertical wet vent. All water closet fixture drains shall connect at the same elevation. Other fixture drains shall connect above or at the same elevation as the water closet fixture drains. The dry vent connection to the vertical wet vent shall be the individual or common vent serving one or two fixtures.

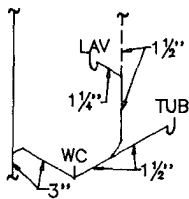
**Table No. P-2207.8.1
WET VENT SIZE**

Pipe size Inches	Fixture unit load (dfu)
1 1/2	1
2	4
2 1/2 ¹	6
3	12
4	32

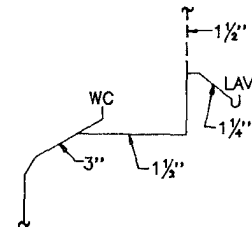
¹No water closets.

Figure Nos. P2207.8.1 and P2207.8.2, pages 231 and 232. Revise figures as shown (R169-93):

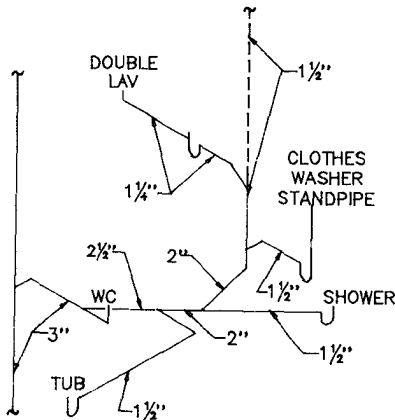
**Figure No. P-2207.8.1
TYPICAL SINGLE-BATH WET-VENT
ARRANGEMENTS**



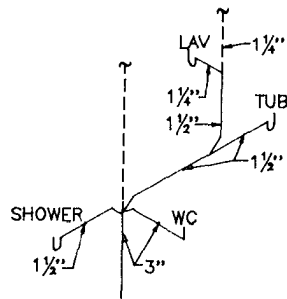
A. TYPICAL SINGLE-BATH



B. TYPICAL POWDER ROOM

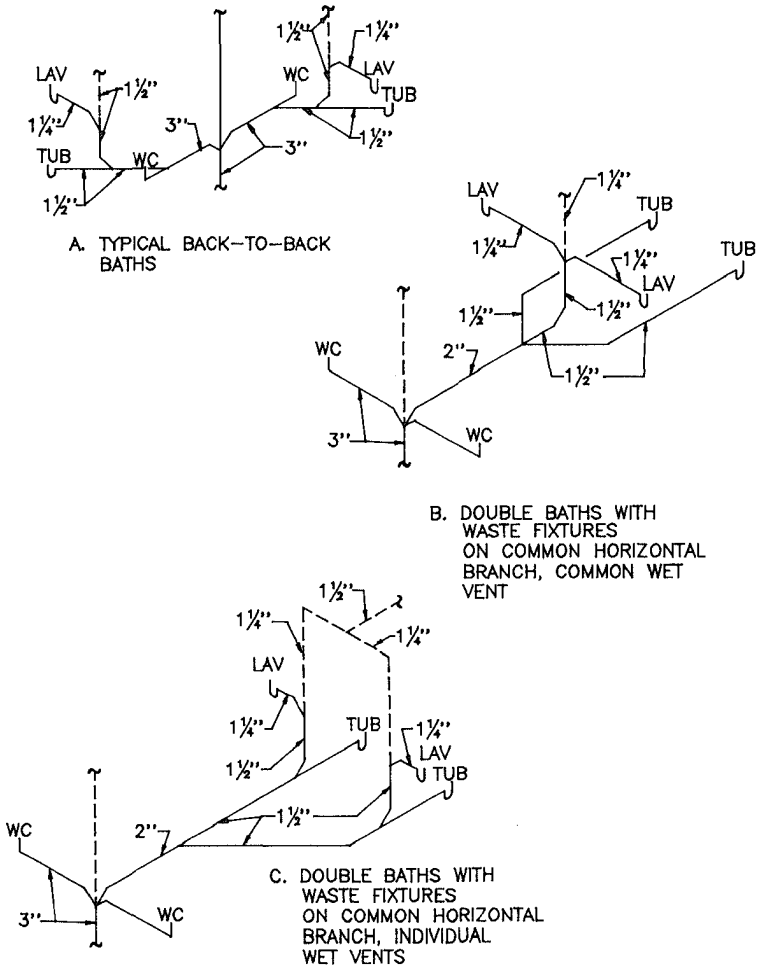


C. MORE ELABORATE SINGLE-BATH ARRANGEMENT



D. COMBINATION WET-AND STACK-VENTING WITH STACK FITTING

Figure No. P-2207.8.2
TYPICAL DOUBLE-BATH WET-VENT
ARRANGEMENT



Section P-2207.9, pages 233-236. Delete section and substitute the following (R201-92):

P-2207.9 Single stack system venting

P-2207.9.1 General: The stack shall be considered a vent for all fixtures discharging to the stack when installed in accordance with the requirements of this section.

P-2207.9.2 Stack installation: The stack shall be vertical and shall not be offset. All fixture drains shall connect separately except that fixtures within the same group shall be permitted to be connected to a common drain. See Figures P-2207.9.2a and P-2207.9.2b for typical stack vent installations.

P-2207.9.3 Stack vent: A stack vent shall be provided for the stack. The size of the stack vent shall be at least one-half the diameter of the required stack size but not less than 1 1/4.

P-2207.9.4 Stack size: The waste stack shall be sized based on the total discharge to the stack and the discharge within a branch interval in accordance with Table P-2207.9.4. The stack shall be the same size throughout its length.

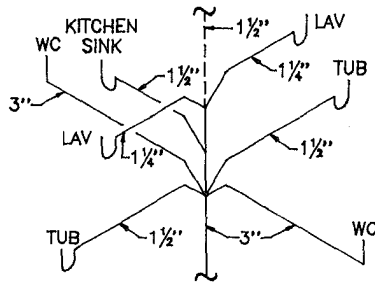
**Table P-2207.9.4
SINGLE STACK SYSTEM SIZING**

Stack size inches	Total discharge into one branch interval (dfu) ¹	Total discharge for stack (dfu)
1 1/2	1	2
2	2	4
2 1/2	NL	8
3	NL	24
4	NL	50

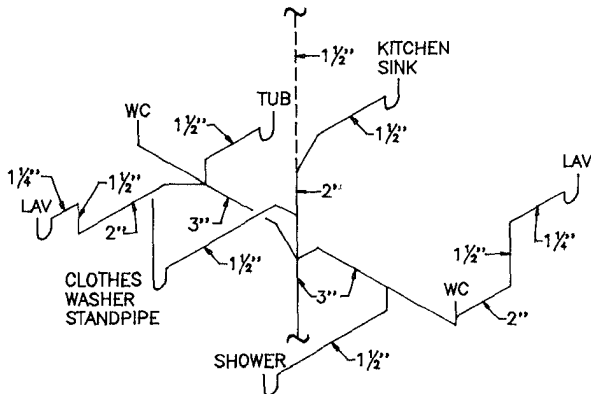
1. NL means no limit

Figures P-2207.9.2 and P-2207.9.3, pages 235 and 236. Revise figure numbers and figures to read as follows (R202-92, R170-93):

Figure No. P-2207.9.2a
TYPICAL METHODS OF CONNECTING FIXTURE DRAINS
TO STACK IN STACK-VENTED SYSTEMS



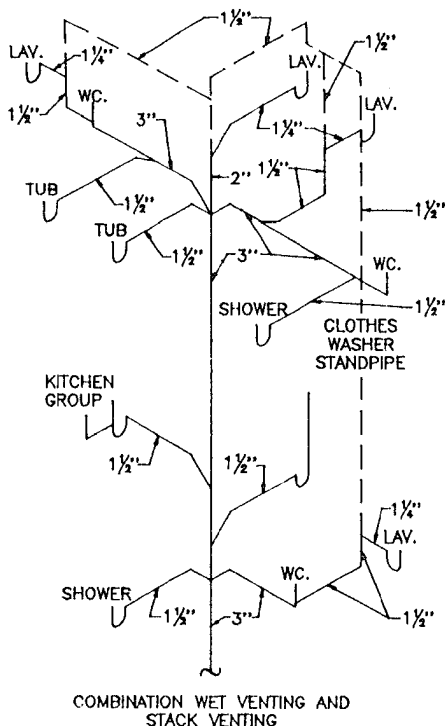
A. WASTE FIXTURES CONNECTED DIRECTLY TO STACK



B. WASTE FIXTURE CONNECTED TO WATER CLOSET HORIZONTAL BRANCH

THIS FIGURE IS FOR ILLUSTRATION PURPOSES ONLY AND THE WRITTEN TEXT SHALL APPLY

Figure No. P-2207.9.2b
TYPICAL SINGLE-STACK SYSTEM
FOR A TWO-STORY DWELLING



Section P-2207.10, pages 236 and 237. Delete section and substitute the following. Revise figures P2207.10a as shown, (R203-92, R171-93):

P-2207.10 Individual fixture vents not required on a neutral horizontal branch: On a uniformly sized horizontal branch, fixtures may be installed without individual vents, provided a vent is installed before the first fixture and after the last fixture connected (see Figure No. P-2207.10a). This branch may discharge into a stack serving upper levels, provided the size of the stack can accommodate the total d.f.u. load connected per Section P-2206.4.1.

Alternatively, the horizontal branch may be reduced in size according to fixture loading requirements. The reduced portion shall be sized as a wet-vented system in conformance with Section P-2207.8.1 (See Figure No. P-2207.10b).

Dry vent sizes shall be determined in accordance with Section P-2207.7.

Figure No. P-2207.10a
TYPICAL UNIFORMLY SIZED HORIZONTAL BRANCH SYSTEM

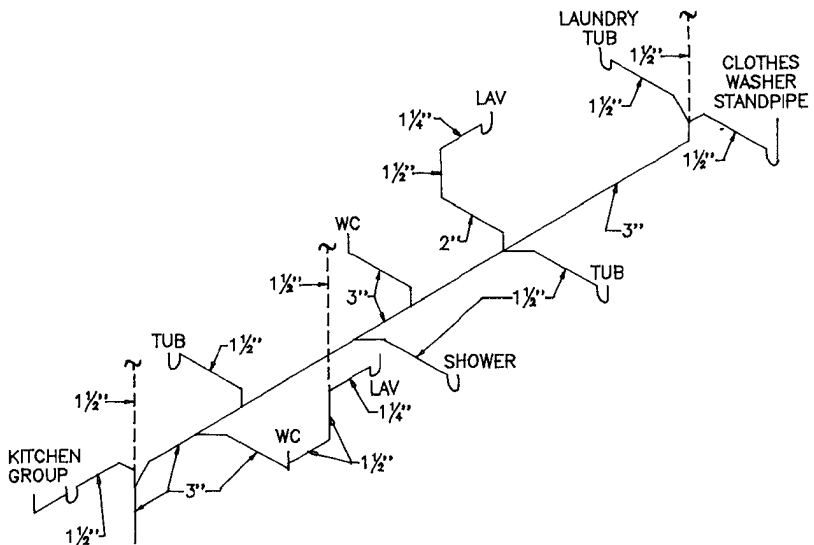
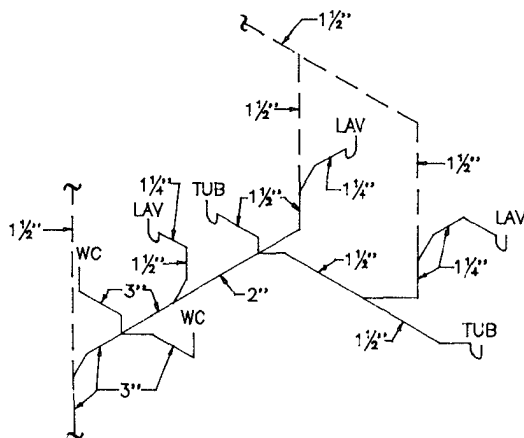


Figure No. P-2207.10b
TYPICAL HORIZONTAL BRANCH SYSTEM REDUCING IN SIZE
UTILIZING WET VENTING



Chapter 23

Table P-2301, page 241. Revise the date and add the following standards (R204-92, R205-92, R206-92, R194-93):

Vitreous China Plumbing Fixtures	ANSI A112.19.2M-90
Hydraulic Performance for Water Closets and Urinals	ANSI A112.19.6-90
Non-Vitreous Ceramic Plumbing Fixtures	ANSI A112.19.9-1991
Plastic Sinks	ANSI Z124.6-1990
Specification for Copper Sheet and Strip for Building Construction	ASTM B 370-1988

Section P-2309.3, page 243. Revise section to read as follows (R207-92):

P-2309.3 Shower heads: Shower heads shall be of the water conserving type, which deliver a maximum flow rate of 2.5 gpm at 80 psi.

Section P-2312.2, page 244. Add new section to read as follows (R207-92):

P-2312.2 Lavatory faucets: Faucets on lavatories shall be of the water conserving type, which deliver a maximum flow rate of 2.2 gpm at 60 psi.

Section P-2313.2, page 244. Revise section to read as follows (R207-92):

P-2313.2 Flushing devices required: Water closets shall be of the water conserving low consumption, 1.6 gpf type and shall be provided with a flush tank or similar device designed and installed to supply water in sufficient quantity and flow to flush the contents of the fixture, to cleanse the fixture and refill the fixture trap.

Section P-2315.2, page 245. Add new section to read as follows (R207-92):

P-2315.2 Sink faucets: Sink faucets shall be of the water conserving type, which deliver a maximum flow rate of 2.2 gpm at 60 psi.

Chapter 24

Table P-2403.1, page 250. Revise the date or add the following standards (R208-92, R209-92, R161-93, R162-93, R172-93, R173-93):

Table P-2403.1
WATER SERVICE, SUPPLY AND DISTRIBUTION PIPING
 (As listed in Section S-26.2001)

MATERIAL	STANDARD NO.
PVC Plastic Pipe Sch. 40, 80 and 120	ASTM D1785-91
Polyethylene Plastic Pipe, Sch. 40	ASTM D2104-89a
Solvent Cement for ABS Plastic Pipe	ASTM D2235-88
Polyethylene (PE) Plastic Pipe Controlled OD	ASTM D2447-89
PVC Plastic Pipe Fittings, Sch. 40	ASTM D2466-90a
Socket Type PVC Plastic Pipe Fittings, Sch. 80	ASTM D2467-90
ABS Plastic Pipe Fittings, Sch. 40	ASTM D2468-90
Solvent Cement for PVC Plastic Pipe	ASTM D2564-91
Plastic Insert Fittings for P.E. Plastic Pipe	ASTM D2609-90
Socket Bell for PVC Plastic Pipe	ASTM D2672-89
CPVC Plastic Hot and Cold Water Distribution Systems	ASTM D2846-90a
Polybutylene (PB) Plastic Pipe (SDR-PR) Based on Outside Diameter	ASTM D3000-89
Butt Heat Fusion P.E. Fittings for P.E. Plastic Pipe and Tubing	ASTM D3261-90
P. B. Plastic Hot Water Distribution Systems	ASTM D3309-92
Socket Type CPVC Plastic Pipe Fittings, Sch. 40	ASTM F438-90
Socket Type CPVC Plastic Pipe Fittings, Sch. 80	ASTM F439-90
Solvent Cement for CPVC Plastic Hot and Cold Water Distribution Systems	ASTM F493-89
Primers for Solvent Cemented PVC Plastic Pipe	ASTM F656-89a
Crosslinked Polyethylene (PEX) Tubing	ASTM F876-90
Crosslinked P.E. Plastic Hot and Cold Water Distribution	ASTM F877-89
Metal Insert Fittings for PB Tubing	ASTM F1380-92

Section P2403.2, page 251. Revise section to read as follows (R174-93):

P-2403.2 Pressure: Minimum average static pressure (as determined by the local water authority) at the building entrance for either public or private water service shall be 40 psi.

The minimum pressure at the point of outlet discharge shall not be less than a flow pressure of 8 psi for all fixtures except where manufacturers require a higher pressure. In determining the minimum pressure, allowance shall be made for pressure losses during maximum demand periods. Pressure and flow requirements to special fixtures, such as low one-piece toilets, shall be determined prior to sizing the piping system.

Maximum average static pressure shall be 80 psi. Where main pressure exceeds 80 psi, an approved pressure-reducing valve shall be installed on the domestic water branch main or riser at the connection to the water service pipe.

Section P2403.5.2, page 251. Revise section to read as follows (R176-93):

P-2403.5.2 Polyethylene plastic piping installation: Polyethylene pipe shall be cut square, using a cutter designed for plastic pipe. Except where joined by heat fusion, pipe ends shall be chamfered to remove sharp edges. Pipe that has been kinked shall not be installed. For bends, the installed radius of pipe curvature shall not be less than 30 pipe diameters, or the coil radius when bending with the coil. Coiled pipe shall not be bent beyond straight. Bends shall not be permitted within ten pipe diameters of any fitting or valve. Stiffener inserts used with compression type fittings shall not extend beyond the clamp or nut of the fitting. Flared joints shall be permitted where recommended by the manufacturer and made by the use of a tool designed for that operation. Heat fusion joints shall be made in accordance with ASTM D2657 or ASTM F1290 listed in Section S-26.2001.

Section P2404.2.2, page 252. Revise section to read as follows (R194-93):

P-2404.2.2 Soldered joints: Soldered joints in tubing shall be made with fittings approved for water piping. Surfaces to be soldered shall be cleaned bright. The joints shall be properly fluxed and made with approved solder. Pipe and fittings used in the water-supply system shall have a maximum of 8 percent lead. Solders and fluxes used in potable water-supply systems shall have a maximum of 0.2 percent lead. Fluxes shall conform to ASTM B 813.

Section P-2408.5, pages 254 and 255. Revise section to read as follows (R212-92, R177-93):

P-2408.5 Relief valves: Relief valves shall have a minimum rated capacity for the equipment served and shall conform to ANSI Z21.22 listed in Section S-26.2405.

P-2408.5.1 Pressure-relief valves: (No change to existing text)

P-2408.5.2 Temperature-relief valves: Temperature-relief valves shall have a relief rating compatible with the temperature conditions of the equipment protected. The valves shall be installed such that the temperature sensing element monitors the water within the top 6 inches of the tank. The valve shall be set to open at a maximum temperature of 210 degrees F.

P-2408.5.3 Combination pressure/temperature-relief valves: (No change to existing text)

P-2408.5.4 Installation of relief valves: A check or shutoff valve shall not be installed in the following locations.

1. Between a relief valve and the termination point of the relief valve discharge pipe;
2. Between a relief valve and a tank; or
3. Between a relief valve and heating equipment.

The diameter of the discharge pipe shall not be smaller than the relief valve outlet. The discharge pipe shall not be trapped, and shall terminate with an air gap into a plumbing fixture, floor drain or other approved point of discharge that will not create a hazard or potential cause of damage.

P-2408.5.5 Relief valves required on water heaters: Equipment used for heating water or storing hot water shall be protected by:

1. A separate pressure relief valve and a separate temperature relief valve; or
2. A combination pressure and temperature relief valve.

P-2408.5.6 Relief valves required on pressure tanks: (No change to existing text)

P-2408.5.7 Relief valve drains: Relief valve drains shall comply with Section P-2409.1 or ASME/ANSI A112.4.1 as listed in Section S-26.2408.

Section P-2409.1, page 255. Revise section to read as follows (R208-92, R178-93):

P-2409.1 Materials: Water-distribution piping within dwelling units shall be as shown in Table P-2403.1. ABS, PVC or PE plastic pipe may be used for cold water only. CPVC, Crosslinked P.E., or PB plastic pipe may be used for both hot and cold water.

Minimum working pressure rating for hot-water piping shall be 100 psi at 180 degrees F. Fittings shall be approved and compatible with the type of piping being used.

Table P-2409.4, page 257. Revise table to read as follows (R213-92):

**Table No. P-2409.4
MINIMUM SIZES OF FIXTURE BRANCHES¹
(Fixture Water-Supply Pipes)²**

TYPE OF FIXTURE OR OUTLET	NOMINAL PIPE SIZE (IN.)
Bathtub (with/without shower head) Clothes-washer supply fitting Dishwasher Kitchen sink Laundry tub (one and two compartment) Shower head Wall hydrant/sill cock/hose bibb	1/2
Bar sink Bidet Lavatory Water closet (close-coupled tank type) ³	3/8

¹Table not applicable to manifold system. See Section P-2409.7.

²For special fixtures or fittings, size according to manufacturer's recommendation.

³Also see Section P-2403.2 or according to manufacturer's specifications.

Section P-2409.5, page 258. Delete section without substitution. Renumber existing P-2409.6 (R213-92):

Section P-2409.6, page 258. Revise #1 to read as follows (R213-92):

1. Determine the total fixture unit load (w.s.f.u.) served by the pipe interval to be sized (refer to Table No. P-2409.2). Working downstream from the farthest fixture or fixture group, add the fixture-unit values and note the totals for each riser, branch or main to be sized. Where fixture groups are being added, use the reduced w.s.f.u. values for fixture groups in Table No. P-2409.2 which take into account probability factors of simultaneous use. Individual fixture branches should be sized from Table No. P-2409.4 rather than Table Nos. P-2409.6a through P-2409.6d.

Part VII, page 270. Delete section without substitution. Move Energy Conservation to Appendix G. (R214-92).

Chapter 26

Section S-26.001, pages 271-274. Revise the following addresses, delete reference and address to AWPB (R215-92, R180-93, R181-93, R182-93):

SECTION S-26.001—ABBREVIATIONS

AISC —	American Institute of Steel Construction One East Wacker, Drive, Chicago, IL 60601-2001
AISI —	American Iron and Steel Institute 1101 17th Street, NW, Washington, DC 20036-4700
GA —	Gypsum Association 810 First Street, NE, Suite 510, Washington, DC 20002
WWPA —	Western Wood Products Association Yeon Building, 522 SW Fifth Avenue, Portland, OR 97204-2122

Section S-26.118, page 274. Revise the date of the following standards (R216-92):

ASTM

C62 - 1991
C216 - 1991
C652 - 1991

Section S-26.118, page 274. Add the following standards (R66-92):

DOC

PS1 - 1992 Construction and Industrial Plywood R-118
PS2 - 1992 Performance Standard for Wood-Based
Structural-Use panels R-118

Section S-26.201, pages 274 and 275. Revise the date of the following standards (R216-92):

ASTM

C34 - 1984 (R1990)
C62 - 1991
C216 - 1991
C652 - 1991

Section S-26.216, page 275. Revise the date or the title of the following standards (R217-92, R218-92):

ASTM

E84 - 1991a

UL

1715 - 1989 Fire Test of Interior Finish Material R-216.1, R-216.3

Section S-26.217, page 276. Revise the date of the following standard (R217-92):

ASTM
E84 - 1991a

Section S-26.218, page 276. Add the following standards (R40-93, R42-93):

SECTION S-26.218 - INSULATION

ASTM
E 84 - 1991a Surface Burning Characteristics
 of Building Materials,
 Test Method for R218.1, R-218.2,
 R-218.3

CAN4-S102.2 - M83 Standard Method of Test for Surface
 Burning Characteristics of Flooring,
 Floor Covering and Miscellaneous
 Materials and Assemblies R-218.2
E 970-1989 Standard Test Method for Critical
 Radiant Flux of Exposed Attic
 Floor Insulation Using A Radiant
 Heat Energy Source..... R-218.3

Section S-26.302, page 276. Revise the date and association of the following standards (R180-93):

AWPA
C22 - 1990 Lumber and Plywood for Permanent
 Wood Foundations - Preservative
 Treatment by Pressure Process R-302.1

Section S-26.302, page 276. Delete BIA 1969 document without substitution (R49-93):

Section S-26.304, page 276. Revise the dates of the following standards (R50-93, R183-93):

ACI
318 - 1989 Building Code Requirements for
(1992 Revisions) Reinforced Concrete..... R-304.1

318.1 - 1989 Building Code Requirements for
(1992 Revisions) Structural Plain Concrete R-304.1

ACI/ASCE/TMS

Building Code Requirements for

Masonry Structures R-304.1

Section S-26.304, page 277. Add the following standards (R42-92, R43-92):

PS2 - 1992

Performance Standard for Wood-Based

Structural Use Panels Table R-304.5

PS20 - 1970

American Softwood Lumber Standard.....R-304.5

(1986)

AWPA

C1 - 1990

C2 - 1990

C3 - 1990

C4 - 1990

C9 - 1990

C18 - 1990

C22 - 1990

C28 - 1990

P2 - 1990

SECTION S-26.221-PROTECTION AGAINST DECAY

DOC

PS1 - 1983

Construction and Industrial Plywood R-402.6

PS2 - 1992

Performance Standard for Wood-Based

Structural-Use Panels R-402.6

PS20 - 1970

American Softwood Lumber Standard.....R-402.1

(1986)

NDS - 1991

National Design Specification for Wood

Construction (with Supplement of Design

Values for Wood Construction) R-402.3

ASTM

C79 - 1992 Standard Specification
for Gypsum Sheathing Board.....Table 402.3a

GA

253 - 1993 Recommended Specifications for
the Application of Gypsum
Sheathing.....Table R-402.3a

Section S-26.403, page 280. Delete the following standard and substitute as shown (R63-92):

Delete

AISC - 1978 Specification for the Design, Fabrication and
Erection of Structural Steel for Buildings.....R-403

Add

AISC

ASD - 1989 Specification for Structural Steel Buildings
Allowable Stress Design and Plastic Design ...R-403.2

LRFD - 1986 Load and Resistance Factor Design
Specification for Structural Steel Buildings.....R-403.2

Section S-26.403, page 280. Revise the date and title or add the following standard (R63-92):

AISI

ASD - 1986/89 Specification for the Design of Cold-Formed
Steel Structural Members, 1986 Edition,
with 1989 Addendum R-403.2

LRFD - 1991 Load and Resistance Factor Design
Specification for Cold-Formed Steel
Structural Members R-403.2

Section S-26.404, page 280. Delete the following standard and substitute as shown (R65-92):

Delete

AISC—1978 Specification for the Design, Fabrication and
Erection of Structural Steel for Buildings.....R-404.8

Add

AISC

ASD - 1989 Specification for Structural Steel Buildings
Allowable Stress Design and Plastic Design .R-404.8

LRFD - 1986 Load and Resistance Factor Design
Specification for Structural Steel Buildings ..R-404.8

1993/1994 Amendments

Section S-26.404, page 281. Delete the following standard without substitution (R49-93):

BIA—1969 Building Code Requirements for Engineered Brick.
Masonry R404.3.1
R404.3.2

Section S-26.404, page 281. Revise the following standard to read as follows (R50-93):

ACI/ASCE/TMS
530/5/402 - 1992 Building Code Requirements
for Masonry Structures R-404.3.1
R-404.3.2

Section S-26.411, page 282. Revise the date and title of the following standard (R221-92):

ASTM
E283 - 1991 Test Method for Rate of Air Leakage Through
Exterior Windows, Curtain Walls and Doors
Under Specified Pressure Differences
Across the Specimen R-411

Section S-26.412, page 282. Revise the date and title of the following standard (R221-92):

ASTM
E283 - 1991 Test Method for Rate of Air Leakage Through
Exterior Windows, Curtain Walls and Doors
Under Specified Pressure Differences
Across the Specimen R-412

Section S-26.413, page 283. Delete the following standard and substitute as shown (R66-92):

Delete

APA

PRP-108 - 1988 Performance Standards and Policies for Structural
Use Panels R-413.1

Add

DOC

PS2 - 1992 Performance Standard for Wood-Based
Structural-Use Panels R-413.1

Section S-26.502, page 283. Add the following standards (R67-92, R91-93, R187-93, R188-93, R189-93, R191-93, R193-93):

AHA

A135.5 - 1988 Prefinished Hardboard Siding R-502.7

One and Two Family Dwelling Code

ANSI

A 108.11	Interior Installation of Cementitious Backer
1990	Units 502.6

ASTM

C843 - 1992	Specification for Application of Gypsum Veneer Base R-502.4
C844 - 1985	Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster (Reapproved 1990) R-502.4
C897 - 1988	Specification for Aggregate for Job-Mixed Portland Cement-Based Plaster R-502.4
C1032 - 1986	Specification for Woven Wire Plaster Base (Reapproved 1990) R-502.4
C1047 - 1985	Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base (Reapproved 1990) R-502.4
C1063 - 1986	Specification for Installation of Lathing and Furring for Portland Cement-Based Plaster..R-502.4

CSSB

CSSB - 1992	Grading Rules for Wood Shakes and Shingles R502.7
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GA

224-1984	Recommended Specification - Installation of Predecorated Gypsum Backing Board.....R-502.3
230 - 1991	Vapor Retarders Over Water-Resistant Gypsum Backing Board.....R-502.2

Section S-26.502, page 283. Revise dates and titles of the following standards, delete standards without substitution (R91-93, R190-93, R193-93):

SECTION S-26.502 - WALL COVERINGS - INTERIOR

Revise:

ASTM

C5 - 1979	Specification for Quicklime for Structural Purposes (Reapproved 1992) R-502.4
C28 - 1992	Specification for Gypsum Plasters R-502.4
C35 - 1989a	Specification for Inorganic Aggregates for Use in Gypsum Plaster R-502.4

1993/1994 Amendments

C36 - 1992	Specification for Gypsum Wallboard.....	R-502.5
C37 - 1992	Specification for Gypsum Lath	R-502.4
C59 - 1991	Specification for Gypsum Casting and Molding Plaster	R-502.4
C61 - 1991	Specification for Gypsum Keene's Cement	R-502.4
C587 - 1991	Specification for Gypsum Veneer Plaster.....	R-502.4
C588 - 1992	Specification for Gypsum Base for Veneer Plasters.....	R-502.4
C631 - 1991	Standard Specification for Bonding Compounds for Interior Plastering.....	R-502.4
C841 - 1990	Specification for Installation of Interior Lathing and Furring.....	R-502.4
C842 - 1985	Specification for Application of Interior Gypsum Plaster (Reapproved 1990)	R-502.4
C847 - 1988	Specification for Metal Lath (Reapproved 1992).....	R-502.4
C933 - 1980	Standard Specification for Welded Wire Lath (Reapproved 1990)	R-502.4

ANSI

A108.1 - 1992	Installation of Ceramic Tile with Portland Cement Mortar	R-502.6
A108.4 - 1992	Ceramic Tile Installed with Water- Resistant Organic Adhesives	R-502.6
A108.5 - 1992	Installation of Ceramic Tile with Dry- Set Portland Cement Mortar or Latex- Portland Cement Mortar	R-502.6
A108.6 - 1992	Installation of Ceramic Tile with Chemical-Resistant, Water Cleanable Tile - Setting and Grouting Epoxy	R-502.6
A118.1 - 1992	Dry-Set Portland Cement Mortar (for Ceramic Tile)	R-502.6
A118.3 - 1992	Standard Specifications for Chemical- Resistant, Water Cleanable Tile - Setting and Grouting Epoxy	R-502.6
A136.1 - 1992	Standard for Organic Adhesives for Installation of Ceramic Tile, Types I and II.....	R-502.6
A137.1 - 1988	Ceramic Tile	R-502.6

CSSB

CSSB-1989	Design and Application Manual for Exterior and Interior Walls	R-502.7
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Delete:

ASTM

C474-1987 Test method for Joint Treatment Materials for
Gypsum Board Construction R-502.6

CSSB

CSSB-1985 Grading and Packing Rules for Certi-split Red
Cedar Shakes R-502.7
CSSB-1984 Grading and Packing Rules for Certigrade Red
Cedar Shingles R-502.7
CSSB-1990 Grading Rules for Certi-sawn Taper-
Sawn Red Cedar Shakes R-502.7

Sections S-26.503, page 285. Delete standards, revise title, and add a standards as follows (R97-93, R102-93):

SECTION S-26.503 - WALL COVERINGS - EXTERIOR

Revise

CSSB

CSSB-1989 Design and Application Manual for
Exterior and Interior Walls R-503.10

Add

ASTM

D3679-92 Standard Specification for Rigid Poly (Vinyl
Chloride)(PVC) Siding

CSSB

CSSB-1992 Grading Rules for Wood Shakes and
Shingles R-503.5

Delete

CSSB-1985 Grading and Packing Rules for Certi-split Red
Cedar Shakes R-503.5
CSSB-1984 Grading and Packing Rules for Certigrade Red
Cedar Shingles R-503.5
CSSB-1990 Grading Rules for Certi-sawn Taper-
Sawn Red Cedar Shakes R-503.5

Section S-26.601, page 286. Revise title to read as follows, revise the date and reference and add the following standards (R73-92, R220-92, R111-93):

1993/1994 Amendments

Revise

SECTION S-26.602—FLOORS - DIMENSION LUMBER

CWC

CWC - 1987 Canadian Dimension Lumber Data Book R-602.2

DOC

PS20 - 1970 American Softwood Lumber Standard R-602.1
(1986)

HPMA

LHF - 1987 Laminated Hardwood Flooring R-602.2

NFoPA

NDS - 1991 National Design Specification for Wood
Construction (with Supplement of Design
Values for Wood Construction).....R-602.2

SFPA

SFPA - 1991 Southern Pine Maximum Spans for
Joints and Rafters R-602.2

WWPA

WWPA - 1992 Western Lumber Span Tables for Floor and
Ceiling joists and Roof Rafters.....R-602.2

Section S-26.602, page. 286. Delete title and revise the references of the following standards (R73-92):

NAHB

NAHB - 1982 NAHB Research Report; Design Tables -
Fabrication Guide, Off-Center Spliced
Floor Joists.....R-602.3.1

TPI

BWT - 1976 Bracing Wood Trusses; Commentary
and Recommendations.....R-602.10

PCT - 1980 Design Specification for Metal Plate
Connected Parallel Chord Wood Trusses.....R-602.10

QST - 1989 Quality Standard for Metal Plate Connected
Wood Trusses R-602.10

TPI - 1985 Design Specification for Metal Plate
Connected Wood Trusses R-602.10

Section S-26.605, page 287. Delete the following standard and substitute as shown (R75-92):

Delete

AISC

AISC - 1978 Specification for the Design, Fabrication and
Erection of Structural Steel for Buildings.....R-605

Add

AISC

- ASD - 1989 Specification for Structural Steel Buildings
 Allowable Stress Design and Plastic Design...R-605.2
- LRFD - 1986 Load and Resistance Factor Design Specification
 for Structural Steel Buildings R-605.2

Section S-26.605 page 287. Add the following standards (R75-92:)

AISI

- ASD - 1986/89 Specification for the Design of Cold-Formed
 Steel Structural Members, 1986 Edition
 with 1989 Addendum R-605.2
- LRFD - 1991 Load and Resistance Factor Design
 Specification for Cold-Formed
 Steel Structural Members R-605.2

Section S-26.606, page 287. Revise title to read as follows, delete the following standard and add as shown (R76-92, R127-93):

**SECTION S-26.606 FLOOR - PLYWOOD AND WOOD
STRUCTURAL PANELS**

Delete

APA

- PRP-108 - 1988 Performance Standards and Policies for
 Structural Use Panels.....R-606.1

Add

DOC

- PS2 - 1992 Performance Standard for Wood-Based
 Structural-Use Panels R-606.1

CSA

- 0437-M92 OSB & Waferboard.....R-606.1

Section S-26.701, page 288. Revise title to read as follows, revise the date and reference, and add the following standards (R73-92, R220-92, R130-93):

SECTION S-26.702—ROOF-CEILING - DIMENSION LUMBER

CWC

- CWC - 1987 Canadian Dimension Lumber Data Book R702.2

DOC

- PS20 - 1970 American Softwood Lumber Standard R-702.1
(1986)

NFoPA

- NDS - 1991 National Design Specification for Wood Construction
 (with Supplement of Design Values for
 Wood Construction) R-702.2

1993/1994 Amendments

SFPA

SFPA - 1991 Southern Pine Maximum Spans for Joists
and Rafters.....R-702.2

WWPA

WWPA - 1992 Western Lumber Span Tables for Floor
and Ceiling Joists and Roof Rafters R-702.2

Section S-26.702, page 288. Delete title and revise the reference of the following standards (R73-92):

ASCE

7 - 1988 Minimum Design Loads for Buildings
and Other Structures.....R-702.11

TPI

BWT - 1976 Bracing Wood Trusses: Commentary
and Recommendations.....R-702.10

PCT - 1980 Design Specification for Metal Plate Connected
Parallel Chord Wood Trusses.....R-702.10

QST - 1989 Quality Standard for Metal Plate Connected
Wood Trusses R-702.10

TPI - 1985 Design Specification for Metal Plate Connected
Wood Trusses R-702.10

Section S-26.703, page 288. Add new section to read as follows (R84-92, R127-93):

**SECTION S-26.703—ROOFS - PLYWOOD AND
WOOD STRUCTURAL PANELS**

APA

E30-1990 Design and Construction Guide: Residential
and Commercial.....R-703.3

CSA

0437-M92 OSB & Waferboard.....R-703.1

DOC

PS 1 - 1983 Construction and Industrial Plywood.....R-703.1

PS 2 - 1992 Performance Standard for Wood-Based
Structural-Use Panels R-703.1

Section S-26.705, pages 288 and 289. Revise the title to read as follows and change section reference (R86-92):

SECTION S-26.705—ROOF CEILINGS - METAL

AA

SAS30 - 1986 Specifications for Aluminum Structures.....R-705.3

One and Two Family Dwelling Code

Section S-26.705, pages 288 and 289. Delete the following standard and substitute as shown (R86-92):

Delete

AISC

AISC - 1978 Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.....R705.1

Add

AISC

ASD - 1989 Specification for Structural Steel Buildings
Allowable Stress Design and Plastic Design...R-705.2

LRFD - 1986 Load and Resistance Factor Design
Specification for Structural Steel Buildings R-705.2

Section S-26.705, pages 288 and 289. Add the following standards (R86-92):

AISI

ASD - 1986/89 Specification for the Design of Cold-Formed
Steel Structural Members, 1986 Edition,
with 1989 Addendum R-705.2

LRFD - 1991 Load and Resistance Factor Design
Specification for Cold-Formed Steel
Structural Members R-705.2

Section S-26.801, pages 289. Add the following standard (R194-93):

SECTION S-26.801 - ROOF COVERING MATERIALS

ASTM

B370-1988 Specification for Copper Sheet and R-801.3
Strip for Building Construction

Section S-26.801, page 289. Revise the date of the following standard (R222-92):

UL

55A - 1983 Materials for Built-Up Roof Coverings
 (Revised 1989).....R-801.3

Section S-26.801, page 289. Delete the following standards and substitute as shown R135-93):

Delete

CSSB-1985 Grading and Packing Rules for Certi-split Red Cedar Shakes (Revised October 1, 1985).....R-801.3

CSSB-1984 Grading and Packing for Certigrade Red Cedar Shingles (Revised February 1, 1984)..R-801.3

CSSB-1990 Grading Rules for Certi-Sawn Taper Sawn Red Cedar Shakes (Revised May 30, 1990) R-801.3

1993/1994 Amendments

Add:

CSSB

CSSB-1992 Grading Rules for Wood Shakes and
Shingles.....R-801.3

Section S-26.901, page 290. Add the following standard (R143-93):

SECTION S-26.901 – MASONRY CHIMNEYS

UL 1777-88 Chimney lines (Revised November 1989) R-901.13

SECTION S-26.1001 –GENERAL

Section S-26.1001, page 290. Add the following standard (R147-93):

NFiPA

54/ANSI National Fuel Gas Code M-1001.3
Z223.1 - 1992

Section S-26.1003, page 290. Add the following standard (R91-92):

ANSI/UL

196 - 1989 Oil Burners Safety Standard M-1003

Section S-26.1010, page 291. Revise the date of the following standard (R217-92):

ASTM

E84 - 1991a Test Method for Surface Burning Characteristics
of Building Materials Defn.

Section S-26.1101, page 291. Add the following standards (R125-92, R126-92, R223-92):

ANSI/UL

727 - 1980/83 Oil-fired Central Furnace M-1101.2.1

UL

559 - 1985 Heat Pumps (Revised December 1987) M-1101.3.1

1096 - 1986 Electric Central Air Heating Equipment
(Revised January 1988) M-1101.2.4

Section S-26.1102, pages 291 and 292. Revise the date and title of the following standards (R224-92):

UL

181 - 1990 Factory-made Air Ducts and Air Connectors
(Revised November 1990).....M-1102.1.1

Section S-26.1102, pages 291 and 292. Add the following standards (R129-92, R130-92):

ASTM

A1248 - 84 Specification for Polyethylene
(1989) Plastics and Extrusion Materials.....M-1102.1

UL

181A - 1991 Closure Systems for use with Air Ducts
and Air Connectors.....M-1102.1.1

Section S-26.1304, page 292. Add the following standards (R194-93):

ASTM

B306-1992	Specification for Copper Drainage Tube Table M-1304.1
B 813-1991	Specification for Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube Table M-1304.1

Section S-26.1401, page 293. Revise title and add the following standard (R225-92):

SECTION S-26.1401—VENTED FLOOR FURNACES

ANSI/UL

729 - 1976/ 1980	Oil-fired Floor Furnaces.....M-1401
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Section S-26.1402, page 293. Add the following standard (R225-92):

ANSI/UL

730 - 1974/ 1980	Oil-fired Wall Furnace M1402
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Section S-26.1403, page 293. Add the following standards (R226-92):

UL 1482-1983	Room heater, solid-fuel type.....	M-1403
UL 896-1973/ 1974	Oil-burning stoves.....	M-1403

Section S-26.1604, page 293. Revise the date of the following standard (R195-93):

NFIPA

54/ANSI	National Fuel Gas Code	M-1604.3.1
Z2231 - 1992		M-1604.3.2

1993/1994 Amendments

Section S-26.1605, page 294. Revise the date of the following standard (R195-93):

NFiPA

54/ANSI National Fuel Gas Code M-1605.4
Z223.1 - 1992

Section S-26.1704, page 294. Revise the date of the following standard (R194-93):

ASTM

B 68-1992 Specification for Seamless Copper Tube,
Bright Annealed.....Table M-1704.1

Section S-26.1705, page 294. Add the following standard (R227-92):

ANSI/ASME

B16.33 - 1981 Manually Operated Metallic Gas Valve for Use
in Gas Piping Systems Up to 125 psig
(size $\frac{1}{2}$ through 2).....M-1705.1

Section S-26.1707, page 295. Add the following title and standard (R155-93):

SECTION S-26.1707—PIPING JOINTS AND CONNECTIONS

NFiPA

54/ANSI National Fuel Gas Code M-1707.6
Z223.1-92

Section S-26.1708, page 295. Revise the date of the following standard (R195-93):

NFiPA

54/ANSI National Fuel Gas Code M-1708.2
Z223.1 - 1992

Section S-26.1709, page 295. Revise title to read as follows and revise the date of the following standard (R228-92, R195-93):

SECTION S-26.1709—PRESSURE PIPING SYSTEMS

NFiPA

54/ANSI
Z223.1 - 1992 National Fuel Gas Code M-1709.1

Section S-26.1801, page 295. Add the following standards (R156-93):

UL 80-80 Standard for Safety for Steel Inside Tanks for Oil-
burner Fuel - with Revisions through
August 1992 M-1801.1

One and Two Family Dwelling Code

UL 142-87	Standard for Safety for Steel Aboveground Tanks for Flammable and Combustible Liquids - with Revisions through September 1987 M-1801.1
UL 443-90	Standard for Safety for Steel Auxiliary Tanks for Oil-Burner Fuel M-1801.1

Section S-26.1911, page 296. Revise the date and title of the following standard (R196-93):

NFPA

52/ANSI - 1992	Compressed National Gas (CNG) Vehicular Fuel Systems M-1911
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Section S-26.2001, pages 296-301. Add the following standard (R208-92, R161-93, R162-93, R165-93, R176-93, R194-93):

ASTM

B 813-1991	Specification for Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube.....Table P-2001.1 & Sec. P-2404.2.2
D2235-88	Solvent Cement for ABS-DWV Pipe and Fittings.....Tables P-2001, P-2202.1, P-2202.2
D2564-91	Solvent Cement for PVC-DWV Pipe and Fittings.....Tables P-2001, P-2202.1, P-2202.2
D2657-90	Standard Practice for Heat-joining Polyolefin Pipe and Fittings Table No. P-2001.1
D2672-89	Socket Bell for PVC-DWV Pipe and Fittings.....Tables P-2001, P-2202.1, P-2202.2
F656-89a	Primers for Solvent Cemented PVC DWV Pipe and Fittings Tables P-2001, P-2202.1, P-2202.2
F876-1992	Specification for Crosslinked Tables P-2001.1, Polyethylene (PEX) Tubing P-2403.1
F877 - 1989	Specifications for Crosslinked Polyethylene (PEX) Plastic Hot and Cold Water Distribution SystemsTable No. P-2403.1
F1290-90	Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings.....Table No. P-2001.1

1993/1994 Amendments

F1380-1992 Specification for Metal Insert
 Fittings for Polybutylene (PB)
 Tubing.....Table No. P-2001.1, Table No. P-2403.1

Section S-26.2001, pages 296-301. Revise the date of the following standards (R190-92, R191-92, R209-92, R229-92, R230-92, R164-93, R172-93):

ANSI

D2661 - 1991	F628 - 1991
D2665 - 1991b	F891 - 1991
D2751 - 1991	

ASTM

D1785 - 1991	F438 - 1990
D2104 - 1989a	F439 - 1990
D2447 - 1989	F493 - 1989
D2466 - 1990a	F628 - 1990
D2467 - 1990	F656 - 1989a
D2468 - 1990	F891 - 1990

D2609 - 1990
D2846 - 1990a
D3122 - 1989
D3261 - 1990
D3309 - 1992

UL

174 - 1989 (Revised January 1991)
441 - 1991
726 - 1990

Section S-26.2001, pages 296-301. Revise the dates and titles of the following standards (R190-92, R191-92, R197-93):

ASTM

D2321-1989	Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.....Table P-2202.2, Table P-2001.1
D2564 - 1991	Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems Table P-2001.1
D2661 - 1990	Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings Table P-2001.1, Table P-2202.1

Section 26.2310, page 302. Add the following standard (R194-93):

ASTM

B 370-1988 Standard Specification for Copper Sheet
and Strip for Building Construction ...Table P-2301 &
Sec. P-2310.2

Section S-26.2408, page 302. Add the following standard (R177-93):

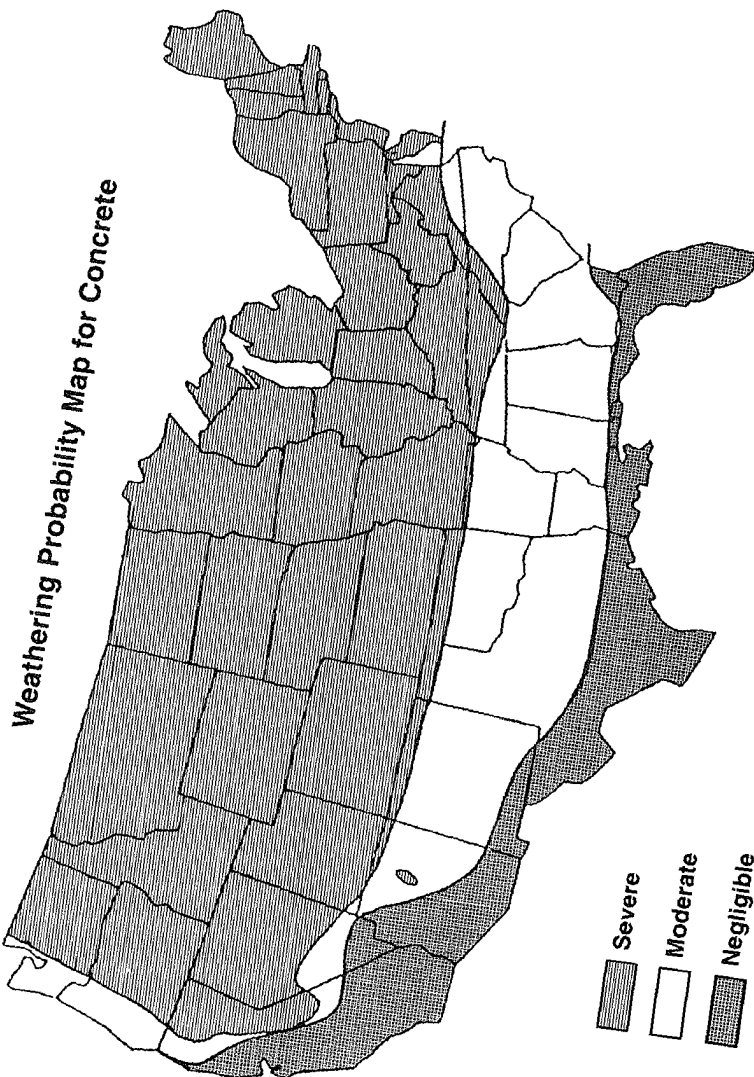
SECTION S-26.2408—RELIEF VALVE DRAINS

ASME/ANSI

A112.4.1-1993 Water Heater Relief Valve Drains.....P-2408.5.7

Section S-26.7000, page 303. Delete section without substitution (R214-92).

Appendix A, Weathering Probability Map, page 308.2. Delete current map and substitute new map, revise notes to read as follows (R198-93):



One and Two Family Dwelling Code

1. Alaska and Hawaii are classified as severe and negligible respectively.
2. Lines defining areas are approximate only. Local conditions may be more or less severe than indicated by the region classification. A severe classification is where weather conditions result in significant snowfall combined with extended periods during which there is little or no natural thawing causing deicing salts to be used extensively.

Appendix B, Table No. 6/7A, pages 356-371. Delete Table and substitute with the following (R231-92):

Table No. 6/7A
DESIGN VALUES FOR JOISTS
AND RAFTERS—VISUAL GRADING

These "F_b" Values are for use where repetitive members are spaced not more than 24 inches apart. For wider spacing the "F_b" values should be reduced 13 percent. Values for surfaced dry or surfaced green lumber apply at 19 percent maximum moisture content in use.

Table No. 6/7A
DESIGN VALUES FOR JOISTS
AND RAFTERS—VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending "F _b "		Modulus of Elasticity "E"	Grading Rules Agency
			Snow Loading	7-Day Loading		
ASPEN						
Select Structural	2"x4"	1510	1735	1885	1100000	Northeastern Lumber Manufacturers Association
No.1		1080	1240	1350	1100000	
No.2		1035	1190	1295	1000000	
No.3		605	695	755	900000	
Stud		600	690	750	900000	
Construction		805	925	1005	900000	
Standard		430	495	540	900000	Northern Softwood Lumber Bureau
Utility		200	230	250	800000	
Select Structural	2"x6"	1310	1505	1635	1100000	
No.1		935	1075	1170	1100000	
No.2		895	1030	1120	1000000	
No.3		525	600	655	900000	
Stud		545	630	685	900000	
Select Structural	2"x8"	1210	1390	1510	1100000	Western Wood Products Association
No.1		865	990	1080	1100000	
No.2		830	950	1035	1000000	
No.3		485	555	605	900000	
Select Structural		1105	1275	1385	1100000	
No.1	2"x10"	790	910	990	1100000	(See notes 1 and 2)
No.2		760	875	950	1000000	
No.3		445	510	555	900000	
Select Structural		1005	1155	1260	1100000	
No.1	2"x12"	720	825	900	1100000	
No.2		690	795	865	1000000	
No.3		405	465	505	900000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS—VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending “Fb”		Modulus of Elasticity “E”	Grading Rules Agency
			Snow Loading	7-Day Loading		
BEECH-BIRCH-HICKORY						
Select Structural	2"X4"	2500	2875	3125	1700000	
No.1		1810	2085	2265	1600000	
No.2		1725	1985	2155	1500000	
No.3		990	1140	1240	1300000	
Stud		980	1125	1225	1300000	
Construction		1325	1520	1655	1400000	
Standard		750	860	935	1300000	
Utility	345	395	430	1200000		
Select Structural	2"X6"	2170	2495	2710	1700000	Northeastern Lumber Manufacturers Association
No.1		1570	1805	1960	1600000	
No.2		1495	1720	1870	1500000	
No.3		860	990	1075	1300000	
Stud	890	1025	1115	1300000		
Select Structural	2"X8"	2000	2300	2500	1700000	(See notes 1 and 2)
No.1		1450	1665	1810	1600000	
No.2		1380	1585	1725	1500000	
No.3		795	915	990	1300000	
Select Structural	2"X10"	1835	2110	2295	1700000	
No.1		1330	1525	1660	1600000	
No.2		1265	1455	1580	1500000	
No.3		725	835	910	1300000	
Select Structural	2"X12"	1670	1920	2085	1700000	
No.1 -		1210	1390	1510	1600000	
No.2		1150	1325	1440	1500000	
No.3		660	760	825	1300000	
COTTONWOOD						
Select Structural	2"X4"	1510	1735	1885	1200000	
No.1		1080	1240	1350	1200000	
No.2		1080	1240	1350	1100000	
No.3		605	695	755	1000000	
Stud		600	690	750	1000000	
Construction		805	925	1005	1000000	
Standard		460	530	575	900000	
Utility		200	230	250	900000	
Select Structural	2"X6"	1310	1505	1635	1200000	Northern Softwood Lumber Bureau
No.1		935	1075	1170	1200000	
No.2		935	1075	1170	1100000	
No.3		525	600	655	1000000	
Stud		545	630	685	1000000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS—VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending "Fb"		Modulus of Elasticity "E"	Grading Rules Agency
			Snow Loading	7-Day Loading		
Select Structural		1210	1390	1510	1200000	
No.1		865	990	1080	1200000	
No.2	2"x8"	865	990	1080	1100000	(See notes 1 and 2)
No.3		485	555	605	1000000	
Select Structural		1105	1275	1385	1200000	
No.1		790	910	910	1200000	
No.2	2"x10"	790	910	990	1100000	
No.3		445	510	555	1000000	
Select Structural		1005	1155	1260	1200000	
No. 1		720	825	900	1200000	
No.2	2"x12"	720	825	900	1100000	
No.3		405	465	505	1000000	
DOUGLAS FIR - LARCH						
Select Structural		2500	2875	3125	1900000	
No. 1 & Btr		1985	2280	2480	1800000	
No.1		1725	1985	2155	1700000	
No. 2	2"x4"	1510	1735	1885	1600000	
No.3		865	990	1080	1400000	
Stud		855	980	1065	1400000	
Construction		1150	1325	1440	1500000	
Standard		635	725	790	1400000	
Utility		315	365	395	1300000	
Select Structural		2170	2495	2710	1900000	West Coast Lumber Inspection Bureau
No. 1 & Btr		1720	1975	2150	1800000	
No.1	2"x6"	1495	1720	1870	1700000	
No 2		1310	1505	1635	1600000	
No 3		750	860	935	1400000	
Stud		775	895	970	1400000	Western Wood Products Association
Select Structural		2000	2300	2500	1900000	
No.1 & Btr		1585	1825	1985	1800000	
No.1	2"x8"	1380	1585	1725	1700000	
No.2		1210	1390	1510	1600000	
No.3		690	795	865	1400000	(See notes 1 and 2)
Select Structural		1835	2110	2295	1900000	
No. 1 & Btr		1455	1675	1820	1800000	
No.1	2"x10"	1265	1455	1580	1700000	
No.2		1105	1275	1385	1600000	
No.3		635	725	790	1400000	
Select Structural		1670	1920	2085	1900000	
No. 1 & Btr		1325	1520	1655	1800000	
No.1	2"x12"	1150	1325	1440	1700000	
No.2		1005	1155	1260	1600000	
No.3		575	660	720	1400000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS—VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending “Fb”		Modulus of Elasticity “E”	Grading Rules Agency
			Snow Loading	7-Day Loading		
DOUGLAS FIR - LARCH (NORTH)						
Select Structural		2245	2580	2805	1900000	
No.1/No.2		1425	1635	1780	1600000	
No.3		820	940	1025	1400000	
Stud	2"X4"	820	945	1030	1400000	
Construction		1095	1255	1365	1500000	
Standard		605	695	755	1400000	
Utility		290	330	360	1300000	
Select Structural		1945	2235	2430	1900000	National Lumber Grades Authority
No.1/No.2	2"X6"	1235	1420	1540	1600000	
No.3		710	815	890	1400000	
Stud		750	860	935	1400000	
Select Structural		1795	2065	2245	1900000	(See notes 1 and 2)
No.1/No.2	2"X8"	1140	1310	1425	1600000	
No.3		655	755	820	1400000	
Select Structural		1645	1890	2055	1900000	
No.1/No.2	2"X10"	1045	1200	1305	1600000	
No.3		600	690	750	1400000	
Select Structural		1495	1720	1870	1900000	
No.1/No.2	2"X12"	950	1090	1185	1600000	
No.3		545	630	685	1400000	
DOUGLAS FIR - SOUTH						
Select Structural		2245	2580	2805	1400000	
No.1		1555	1785	1940	1300000	
No.2		1425	1635	1780	1200000	
No.3	2"X4"	820	940	1025	1100000	
Stud		820	945	1030	1100000	
Construction		1065	1225	1330	1200000	
Standard		605	695	755	1100000	
Utility		290	330	360	1000000	
Select Structural		1945	2235	2430	1400000	
No.1		1345	1545	1680	1300000	Western Wood Products Association
No.2	2"X6"	1235	1420	1540	1200000	
No.3		710	815	890	1100000	
Stud		750	860	935	1100000	
Select Structural		1795	2065	2245	1400000	
No.1		1240	1430	1555	1300000	
No.2	2"X8"	1140	1310	1425	1200000	(See notes 1 and 2)
No.3		655	755	820	1100000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending "F _b "		Modulus of Elasticity "E"	Grading Rules Agency
			Snow Loading	7-Day Loading		
EASTERN SOFTWOODS						
Select Structural		2155	2480	2695	1200000	Northeastern Lumber Manufacturers Association
No.1		1335	1535	1670	1100000	
No.2		990	1140	1240	1100000	
No.3	2"X4"	605	695	755	900000	
Stud		570	655	710	900000	
Construction		775	895	970	1000000	
Standard		430	495	540	900000	
Utility		200	230	250	800000	
Select Structural		1870	2150	2335	1200000	
No.1		1160	1330	1450	1100000	
No.2	2"X6"	860	990	1075	1100000	
No.3		525	600	655	900000	
Stud		520	595	645	900000	
Select Structural		1725	1985	2155	1200000	
No.1		1070	1230	1335	1100000	
No.2	2"X8"	795	915	990	1100000	
No.3		485	555	605	900000	
Select Structural		1580	1820	1975	1200000	(See notes 1 and 2)
No.1		980	1125	1225	1100000	
No.2	2"X10"	725	835	910	1100000	
No.3		445	510	555	900000	
Select Structural		1440	1655	1795	1200000	
No.1		890	1025	1115	1100000	
No.2	2"X12"	660	760	825	1100000	
No.3		405	465	505	900000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency	
		Normal Duration	Snow Loading	7-Day Loading			
EASTERN WHITE PINE							
Select Structural	2"X4"	2155	2480	2695	1200000	Northeastern Lumber Manufacturers Association	
No.1		1335	1535	1670	1100000		
No.2		990	1140	1240	1100000		
No.3		605	695	755	900000		
Stud		570	655	710	900000		
Construction		775	895	970	1000000		
Standard	2"X6"	430	495	540	900000	Northern Softwood Lumber Bureau	
Utility		200	230	250	800000		
Select Structural		1870	2150	2335	1200000		
No.1		1160	1330	1450	1100000		
No.2		860	990	1075	1100000		
No.3		525	600	655	900000		
Stud	520	595	645	900000	(See notes 1 and 2)		
Select Structural	2"X8"	1725	1985	2155		1200000	
No.1		1070	1230	1335		1100000	
No.2		795	915	990		1100000	
No.3		485	555	605		900000	
Select Structural		1580	1820	1975		1200000	
No.1		980	1125	1225	1100000		
No.2	2"X10"	725	835	910	1100000		
No.3		445	510	555	900000		
Select Structural		1440	1655	1795	1200000		
No.1		890	1025	1115	1100000		
No.2		660	760	825	1100000		
No.3		405	465	505	900000		
HEM - FIR							
Select Structural	2"X4"	2415	2775	3020	1600000		
No.1 & Btr		1810	2085	2265	1500000		
No.1		1640	1885	2050	1500000		
No.2		1465	1685	1835	1300000		
No.3		865	990	1080	1200000		
Stud		855	980	1065	1200000		
Construction	2"X 12"	1120	1290	1400	1300000		
Standard		635	725	790	1200000		
Utility		290	330	360	1100000		
Select Structural		2095	2405	2615	1600000		West Coast Lumber Inspection Bureau
No.1 & Btr		1570	1805	1960	1500000		
No.1		1420	1635	1775	1500000		
No.2	1270	1460	1590	1300000			
No. 3	750	860	935	1200000			
Stud	775	895	970	1200000	Western Wood		

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
Select Structural No. & Btr		1930	2220	2415	1600000	Products Association
No.1	2"X8"	1450	1665	1810	1500000	
No.2		1310	1510	1640	1500000	
No.3		1175	1350	1465	1300000	
		690	795	865	1200000	(See notes 1 and 2)
Select Structural No.1 & Btr		1770	2035	2215	1600000	
No.1	2"X10"	1330	1525	1660	1500000	
No.2		1200	1380	1500	1500000	
No.3		1075	1235	1345	1300000	
		635	725	790	1200000	
Select Structural No.1 & Btr		1610	1850	2015	1600000	
No.1	2"X12"	1210	1390	1510	1500000	
No.2		1095	1255	1365	1500000	
No.3		980	1125	1220	1300000	
		575	660	720	1200000	
HEM-FIR (NORTH)						
Select Structural		2245	2580	2805	1700000	
No.1/No.2		1725	1985	2155	1600000	
No.3		990	1140	1240	1400000	
Stud	2"X4"	980	1125	1225	1400000	
Construction		1325	1520	1655	1500000	
Standard		720	825	900	1400000	
Utility		345	395	430	1300000	
Select Structural		1945	2235	2430	1700000	National Lumber Grades Authority
No.1/No.2	2"X6"	1495	1720	1870	1600000	
No.3		860	990	1075	1400000	
Stud		890	1025	1115	1400000	
Select Structural		1795	2065	2245	1700000	
No.1/No.2	2"X8"	1380	1585	1725	1600000	(See notes 1 and 2)
No.3		795	915	990	1400000	
Select Structural		1645	1890	2055	1700000	
No.1/No.2	2"X10"	1265	1455	1580	1600000	
No.3		725	835	910	1400000	
Select Structural		1495	1720	1870	1700000	
No.1/No.2	2"X12"	1150	1325	1440	1600000	
No.3		660	760	825	1400000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending "Fb"		Modulus of Elasticity "E"	Grading Rules Agency
			Snow Loading	7-Day Loading		
MIXED MAPLE						
Select Structural		1725	1985	2155	1300000	
No.1		1250	1440	1565	1200000	
No.2		1210	1390	1510	1100000	
No.3	2"X4"	690	795	865	1000000	
Stud		695	800	870	1000000	
Construction		920	1060	1150	1100000	
Standard		520	595	645	1000000	
Utility		260	300	325	900000	
Select Structural		1495	1720	1870	1300000	
No.1		1085	1245	1355	1200000	Northeastern Lumber Manufacturers Association
No.2	2"X6"	1045	1205	1310	1100000	
No.3		600	690	750	1000000	
Stud		635	725	790	1000000	
Select Structural		1380	1585	1725	1300000	
No.1		1000	1150	1250	1200000	
No.2	2"X8"	965	1110	1210	1100000	(See notes 1 and 2)
No.3		550	635	690	1000000	
Select Structural		1265	1455	1580	1300000	
No.1		915	1055	1145	1200000	
No.2	2"X10"	885	1020	1105	1100000	
No.3		505	580	635	1000000	
Select Structural		1150	1325	1440	1300000	
No.1		835	960	1040	1200000	
No.2	2"X12"	805	925	1005	1100000	
No.3		460	530	575	1000000	
MIXED OAK						
Select Structural		1985	2280	2480	1100000	
No.1		1425	1635	1780	1000000	
No.2		1380	1585	1725	900000	
No.3	2"X4"	820	940	1025	800000	
Stud		790	910	990	800000	
Construction		1065	1225	1330	900000	
Standard		605	695	755	800000	
Utility		290	330	360	800000	
Select Structural		1720	1975	2150	1100000	
No.1		1235	1420	1540	1000000	Northeastern Lumber Manufacturers Association
No.2	2"X6"	1195	1375	1495	900000	
No.3		710	815	890	800000	
Stud		720	825	900	800000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
Select Structural		1585	1825	1985	1100000	
No.1		1140	1310	1425	1000000	
No.2	2"x8"	1105	1270	1380	900000	(See notes 1 and 2)
No.3		655	755	820	800000	
Select Structural		1455	1675	1820	1100000	
No.1		1045	1200	1305	1000000	
No.2	2"x10"	1010	1165	1265	900000	
No.3		600	690	750	800000	
Select Structural		1325	1520	1655	1100000	
No.1		950	1090	1185	1000000	
No.2	2"x12"	920	1060	1150	900000	
No.3		545	630	685	800000	
MIXED SOUTHERN PINE						
Select Structural		2360	2710	2945	1600000	
No.1		1670	1920	2085	1500000	
No.2		1495	1720	1870	1400000	
No.3	2"x4"	865	990	1080	1200000	
Stud		890	1025	1115	1200000	
Construction		1150	1325	1440	1300000	
Standard		635	725	790	1200000	
Utility		315	365	395	1100000	
Select Structural		2130	2445	2660	1600000	
No.1		1495	1720	1870	1500000	
No.2	2"x6"	1325	1520	1655	1400000	
No.3		775	895	970	1200000	Southern Pine Inspection Bureau
Stud		775	895	970	1200000	
Select Structural		2015	2315	2515	1600000	
No.1		1380	1585	1725	1500000	
No.2	2"x8"	1210	1390	1510	1400000	
No.3		720	825	900	1200000	(See notes 1 and 2)
Select Structural		1725	1985	2155	1600000	
No.1		1210	1390	1510	1500000	
No.2	2"x10"	1065	1225	1330	1400000	
No.3		605	695	755	1200000	
Select Structural		1610	1850	2015	1600000	
No.1		1120	1290	1400	1500000	
No.2	2"x12"	1005	1155	1260	1400000	
No.3		575	660	720	1200000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
NORTHERN RED OAK						
Select Structural	2"x4"	2415	2775	3020	1400000	
No.1		1725	1985	2155	1400000	
No.2		1680	1935	2100	1300000	
No.3		950	1090	1185	1200000	
Stud		950	1090	1185	1200000	
Construction		1265	1455	1580	1200000	
Standard		720	825	900	1100000	
Utility	345	395	430	1000000		
Select Structural	2"x6"	2095	2405	2615	1400000	Northeastern Lumber Manufacturers Association
No.1		1495	1720	1870	1400000	
No.2		1460	1675	1820	1300000	
No.3		820	945	1030	1200000	
Stud		865	990	1080	1200000	
Select Structural	2"x8"	1930	2220	2415	1400000	(See notes 1 and 2)
No.1		1380	1585	1725	1400000	
No.2		1345	1545	1680	1300000	
No.3		760	875	950	1200000	
Select Structural	2"x10"	1770	2035	2215	1400000	
No.1		1265	1455	1580	1400000	
No.2		1235	1420	1540	1300000	
No.3		695	800	870	1200000	
Select Structural	2"x12"	1610	1850	2015	1400000	
No.1		1150	1325	1440	1400000	
No.2		1120	1290	1400	1300000	
No.3		635	725	790	1200000	
NORTHERN SPECIES						
Select Structural	2"x4"	1640	1885	2050	1100000	
No.1/No. 2		990	1140	1240	1100000	
No.3		605	695	755	1000000	
Stud		570	655	710	1000000	
Construction		775	895	970	1000000	
Standard		430	495	540	900000	
Utility		200	230	250	900000	
Select Structural	2"x6"	1420	1635	1775	1100000	National Lumber Grades Authority
No.1/No.2		860	990	1075	1100000	
No.3		525	600	655	1000000	
Stud		520	595	645	1000000	
Select Structural	2"x8"	1310	1510	1640	1100000	(See notes 1 and 2)
No.1/No.2		795	915	990	1100000	
No.3		485	555	605	1000000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
Select Structural		1200	1380	1500	1100000	
No.1/No.2	2"X10"	725	835	910	1100000	
No.3		445	510	555	1000000	
Select Structural		1095	1255	1365	1100000	
No.1/No. 2	2"X 12"	660	760	825	1100000	
No.3		405	465	505	1000000	
NORTHERN WHITE CEDAR						
Select Structural		1335	1535	1670	800000	
No.1		990	1140	1240	700000	
No.2		950	1090	1185	700000	
No.3	2"X4"	560	645	700	600000	
Stud		540	620	670	600000	
Construction		720	825	900	700000	
Standard		405	465	505	600000	
Utility		200	230	250	600000	
Select Structural		1160	1330	1450	800000	
No.1		860	990	1075	700000	
No.2	2"X6"	820	945	1030	700000	
No.3		485	560	605	600000	
Stud		490	560	610	600000	Northeastern Lumber Manufacturers Association
Select Structural		1070	1230	1335	800000	
No.1		795	915	990	700000	
No.2	2"X8"	760	875	950	700000	
No.3		450	515	560	600000	(See notes 1 and 2)
Select Structural		980	1125	1225	800000	
No.1		725	835	910	700000	
No.2	2"X10"	695	800	870	700000	
No.3		410	475	515	600000	
Select Structural		890	1025	1115	800000	
No.1		660	760	825	700000	
No.2	2"X12"	635	725	790	700000	
No.3		375	430	465	600000	
RED MAPLE						
Select Structural		2245	2580	2805	1700000	
No.1		1595	1835	1995	1600000	
No.2		1555	1785	1940	1500000	
No.3	2"X4"	905	1040	1130	1300000	
Stud		885	1020	1105	1300000	
Construction		1210	1390	1510	1400000	
Standard		660	760	825	1300000	
Utility		315	365	395	1200000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
Select Structural		1945	2235	2430	1700000	
No.1		1385	1590	1730	1600000	Northeastern Lumber Manufacturers Association
No.2	2"X6"	1345	1545	1680	1500000	
No.3		785	905	980	1300000	
Stud		805	925	1005	1300000	
Select Structural		1795	2065	2245	1700000	
No.1		1275	1470	1595	1600000	
No.2	2"X8"	1240	1430	1555	1500000	(See notes 1 and 2)
No.3		725	835	905	1300000	
Select Structural		1645	1890	2055	1700000	
No.1		1170	1345	1465	1600000	
No.2	2"X10"	1140	1310	1425	1500000	
No.3		665	765	830	1300000	
Select Structural		1495	1720	1870	1700000	
No.1		1065	1225	1330	1600000	
No.2	2"X12"	1035	1150	1295	1500000	
No.3		605	695	755	1300000	
RED OAK						
Select Structural		1985	2280	2480	1400000	
No.1		1425	1635	1780	1300000	
No.2		1380	1585	1725	1200000	
No.3	2"X4"	820	940	1025	1100000	
Stud		790	910	990	1100000	
Construction		1065	1225	1330	1200000	
Standard		605	695	755	1100000	
Utility		290	330	360	1000000	
Select Structural		1720	1975	2150	1400000	
No.1		1235	1420	1540	1300000	Northeastern Lumber Manufacturers Association
No.2	2"X6"	1195	1375	1495	1200000	
No.3		710	815	890	1100000	
Stud		720	825	900	1100000	
Select Structural		1585	1825	1985	1400000	
No.1		1140	1310	1425	1300000	
No.2	2"X8"	1105	1270	1380	1200000	(See notes 1 and 2)
No.3		655	755	820	1100000	
Select Structural		1455	1675	1820	1400000	
No.1		1045	1200	1305	1300000	
No.2	2"X10"	1010	1165	1265	1200000	
No.3		600	690	750	1100000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
Select Structural		1325	1520	1655	1400000	
No.1		950	1090	1185	1300000	
No.2	2"x12"	920	1060	1150	1200000	
No.3		545	630	685	1100000	
REDWOOD						
Clear Structural		3020	3470	3775	1400000	
Select Structural		2330	2680	2910	1400000	
Select Structural, open grain		1900	2180	2370	1100000	
No.1		1680	1935	2100	1300000	
No.1, open grain		1335	1535	1670	1100000	
No.2		1595	1835	1995	1200000	
No.2, open grain	2"x4"	1250	1440	1565	1000000	
No.3		905	1040	1130	1100000	
No.3, open grain		735	845	915	900000	
Stud		725	835	910	900000	
Construction		950	1090	1185	900000	
Standard		520	595	645	900000	
Utility		260	300	325	800000	
Clear Structural		2615	3010	3270	1400000	
Select Structural		2020	2320	2525	1400000	
Select Structural, open grain		1645	1890	2055	1100000	
No.1		1460	1675	1820	1300000	
No.1, open grain		1160	1330	1450	1100000	
No.2		1385	1590	1730	1200000	
No.2, open grain	2"x6"	1085	1245	1355	1000000	
No.3		785	905	980	1100000	
No.3, open grain		635	730	795	900000	
Stud		660	760	825	900000	
Clear Structural		2415	2775	3020	1400000	Redwood Inspection Service
Select Structural		1865	2140	2330	1400000	
Select Structural, open grain		1520	1745	1900	1100000	
No.1		1345	1545	1680	1300000	
No.1, open grain	2"x8"	1070	1230	1335	1100000	
No.2		1275	1470	1595	1203000	
No.2, open grain		1000	1150	1250	1000000	(See notes 1 and 2)
No.3		725	835	905	1100000	
No.3, open grain		585	675	735	900000	
Clear Structural		2215	2545	2765	1400000	
Select Structural		1710	1965	2135	1400000	
Select Structural, open grain		1390	1600	1740	1100000	
No.1		1235	1420	1540	1300000	
No.1, open grain	2"x10"	980	1125	1225	1100000	
No.2		1170	1345	1465	1200000	
No.2, open grain		915	1055	1145	1000000	
No.3		665	765	830	1100000	
No.3, open grain		540	620	670	900000	

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Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
Clear Structural		2015	2315	2515	1400000	
Select Structural		1555	1785	1940	1400000	
Select Structural, open grain		1265	1455	1580	1100000	
No.1		1120	1290	1400	1300000	
No.1, open grain	2"X12"	890	1025	1115	1100000	
No.2		1065	1225	1330	1200000	
No.2, open grain		835	960	1040	1000000	
No.3		605	695	755	1100000	
No.3, open grain		490	560	610	900000	
SOUTHERN PINE						
Dense Select Structural		3510	4035	4385	1900000	
Select Structural		3280	3770	4095	1800000	
Non-Dense Select Structural		3050	3505	3810	1700000	
No.1 Dense		2300	2645	2875	1800000	
No.1		2130	2445	2660	1700000	
No.1 Non-Dense		1955	2250	2445	1600000	
No.2 Dense	2"X4"	1955	2250	2445	1700000	
No.2		1725	1985	2155	1600000	
No.2 Non-Dense		1555	1785	1940	1400000	
No.3		980	1125	1220	1400000	
Stud		1005	1155	1260	1400000	
Construction		1265	1455	1580	1500000	
Standard		720	825	900	1300000	
Utility		345	395	430	1300000	
Dense Select Structural		3105	3570	3880	1900000	
Select Structural		2935	3370	3665	1800000	
Non-Dense Select Structural		2705	3110	3380	1700000	
No.1 Dense		2015	2315	2515	1800000	
No.1		1900	2180	2370	1700000	
No.1 Non-Dense	2"X6"	1725	1985	2155	1600000	
No.2 Dense		1670	1920	2085	1700000	
No.2		1440	1655	1795	1600000	
No.2 Non-Dense		1325	1520	1655	1400000	
No.3		865	990	1080	1400000	
Stud		890	1025	1115	1400000	
Dense Select Structural		2820	3240	3520	1900000	Southern Pine Inspection Bureau
Select Structural		2645	3040	3305	1800000	
Non-Dense Select Structural		2415	2775	3020	1700000	
No.1 Dense		1900	2180	2370	1800000	
No.1		1725	1985	2155	1700000	
No.1 Non-Dense	2"X8"	1555	1785	1940	1600000	
No.2 Dense		1610	1850	2015	1700000	(See notes 1 and 2)
No.2		1380	1585	1725	1600000	
No.2 Non-Dense		1265	1455	1580	1400000	
No.3		805	925	1005	1400000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
Dense Select Structural		2475	2845	3090	1900000	
Select Structural		2360	2710	2945	1800000	
Non-Dense Select Structural		2130	2445	2660	1700000	
No.1 Dense		1670	1920	2085	1800000	
No.1		1495	1720	1870	1700000	
No.1 Non-Dense	2"X10"	1380	1585	1725	1600000	
No.2 Dense		1380	1585	1725	1700000	
No.2		1210	1390	1510	1600000	
No.2 Non-Dense		1095	1255	1365	1400000	
No.3		690	795	865	1400000	
Dense Select Structural		2360	2710	2945	1900000	
Select Structural		2185	2515	2730	1800000	
Non-Dense Select Structural		2015	2315	2515	1700000	
No.1 Dense		1555	1785	1940	1800000	
No.1		1440	1655	1795	1700000	
No.1 Non-Dense	2"X12"	1325	1520	1655	1600000	
No.2 Dense		1325	1520	1655	1700000	
No.2		1120	1290	1400	1600000	
No.2 Non-Dense		1035	1190	1295	1400000	
No.3		660	760	825	1400000	
SPRUCE - PINE - FIR						
Select Structural		2155	2480	2695	1500000	
No.1/No.2		1510	1735	1885	1400000	
No.3		865	990	1080	1200000	
Stud	2"X4"	855	980	1065	1200000	
Construction		1120	1290	1400	1300000	
Standard		635	725	790	1200000	
Utility		290	330	360	1100000	
Select Structural		1870	2150	2335	1500000	National Lumber Grades Authority
No.1/No.2	2"X6"	1310	1505	1635	1400000	
No.3		750	860	935	1200000	
Stud		775	895	970	1200000	
Select Structural		1725	1985	2155	1500000	(See notes 1 and 2)
No.1/No.2	2"X8"	1210	1390	1510	1400000	
No.3		690	795	865	1200000	
Select Structural		1580	1820	1975	1500000	
No.1/No.2	2"X10"	1105	1275	1385	1400000	
No.3		635	725	790	1200000	
Select Structural		1440	1655	1795	1500000	
No.1/No.2	2"X12"	1005	1155	1260	1400000	
No.3		575	660	720	1200000	

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Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending "Fb"		Modulus of Elasticity "E"	Grading Rules Agency
			Snow Loading	7-Day Loading		
SPRUCE-PINE-FIR (SOUTH)						
Select Structural	2"x4"	2245	2580	2805	1300000	Northeastern Lumber Manufacturers Association
No.1		1465	1685	1835	1200000	
No.2		1295	1490	1615	1100000	
No.3		735	845	915	1000000	
Stud		725	835	910	1000000	
Construction		980	1125	1220	1000000	
Standard		545	630	685	900000	
Utility	260	300	335	900000		
Select Structural	2"x6"	1945	2235	2430	1300000	Northern Softwood Lumber Bureau
No.1		1270	1460	1590	1200000	
No.2		1120	1290	1400	1100000	
No. 3		635	730	795	1000000	
Stud		660	760	825	1000000	
Select Structural	2"x8"	1795	2065	2245	1300000	West Coast Lumber Inspection Bureau
No.1		1175	1350	1465	1200000	
No.2		1035	1190	1295	1100000	
No.3		585	675	735	1000000	
Select Structural	2"x10"	1645	1890	2055	1300000	Western Wood Products Association
No.1		1075	1235	1345	1200000	
No.2		950	1090	1185	1100000	
No.3		540	620	670	1000000	
Select Structural	2"x12"	1495	1720	1870	1300000	(See notes 1 and 2)
No.1		980	1125	1220	1200000	
No.2		865	990	1080	1100000	
No 3		490	560	610	1000000	
WESTERN CEDARS						
Select Structural	2"x4"	1725	1985	2155	1100000	West Coast Lumber Inspection Bureau
No.1		1250	1440	1565	1000000	
No.2		1210	1390	1510	1000000	
No.3		690	795	865	900000	
Stud		695	800	870	900000	
Construction		920	1060	1150	900000	
Standard		520	595	645	800000	
Utility		260	300	325	800000	
Select Structural	2"x6"	1495	1720	1870	1100000	West Coast Lumber Inspection Bureau
No.1		1085	1245	1355	1000000	
No.2		1045	1205	1310	1000000	
No.3		600	690	750	900000	
Stud		635	725	790	900000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Design Value in Bending "Fb"			Modulus of Elasticity "E"	Grading Rules Agency
		Normal Duration	Snow Loading	7-Day Loading		
Select Structural	2"X8"	1380	1585	1725	1100000	Western Wood Products Association
No.1		1000	1150	1250	1000000	
No.2		965	1110	1210	1000000	
No.3		550	635	690	900000	
Select Structural	2"X10"	1265	1455	1580	1100000	(See notes 1 and 2)
No.1		915	1055	1145	1000000	
No.2		885	1020	1105	1000000	
No.3		505	580	635	900000	
Select Structural	2"X12"	1150	1325	1440	1100000	
No.1		835	960	1040	1000000	
No.2		805	925	1005	1000000	
No.3		460	530	575	900000	
WESTERN WOODS						
Select Structural	2"X4"	1510	1735	1885	1200000	
No.1		1120	1290	1400	1100000	
No.2		1120	1290	1400	1000000	
No.3		645	745	810	900000	
Stud		635	725	790	900000	
Construction		835	960	1040	1000000	
Standard		460	530	575	900000	
Utility		230	265	290	800000	
Select Structural	2"X6"	1310	1505	1635	1200000	West Coast Lumber Inspection Bureau
No.1		970	1120	1215	1100000	
No.2		970	1120	1215	1000000	
No.3		560	645	700	900000	
Stud		575	660	720	900000	Western Wood Products Association
Select Structural	2"X8"	1210	1390	1510	1200000	
No.1		895	1030	1120	1100000	
No.2		895	1030	1120	1000000	
No.3		520	595	645	900000	
Select Structural	2"X10"	1105	1275	1385	1200000	(See notes 1 and 2)
No.1		820	945	1030	1100000	
No.2		820	945	1030	1000000	
No.3		475	545	595	900000	
Select Structural	2"X12"	1005	1155	1260	1200000	
No.1		750	860	935	1100000	
No.2		750	860	935	1000000	
No.3		430	495	540	900000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending "Fb"		Modulus of Elasticity "E"	Grading Rules Agency
			Snow Loading	7-Day Loading		
WHITE OAK						
Select Structural		2070	2380	2590	1100000	
No.1		1510	1735	1885	1000000	
No.2		1465	1685	1835	900000	
No.3	2"X4"	820	940	1025	800000	
Stud		820	945	1030	800000	
Construction		1095	1255	1365	900000	
Standard		605	695	755	800000	
Utility		290	330	360	800000	
Select Structural		1795	2065	2245	1100000	
No.1		1310	1505	1635	1000000	Northeastern Lumber Manufacturers Association
No.2	2"X6"	1270	1460	1590	900000	
No.3		710	815	890	800000	
Stud		750	860	935	800000	
Select Structural		1655	1905	2070	1100000	
No.1		1210	1390	1510	1000000	
No.2	2"X8"	1175	1350	1465	900000	(See notes 1 and 2)
No.3		655	755	820	800000	
Select Structural		1520	1745	1900	1100000	
No.1		1105	1275	1385	1000000	
No.2	2"X10"	1075	1235	1345	900000	
No.3		600	690	750	800000	
Select Structural		1380	1585	1725	1100000	
No.1		1005	1155	1260	1000000	
No.2	2"X12"	980	1125	1220	900000	
No.3		545	630	685	800000	
YELLOW POPLAR						
Select Structural		1725	1985	2155	1500000	
No.1		1250	1440	1565	1400000	
No.2		1210	1390	1510	1300000	
No.3	2"X4"	690	795	865	1200000	
Stud		695	800	870	1200000	
Construction		920	1060	1150	1300000	
Standard		520	595	645	1100000	
Utility		230	265	290	1100000	
Select Structural		1495	1720	1870	1500000	
No.1		1085	1245	1355	1400000	Northern Softwood Lumber Bureau
No.2	2"X6"	1045	1205	1310	1300000	
No.3		600	690	750	1200000	
Stud		635	725	790	1200000	

Table No. 6/7A (continued)
DESIGN VALUES FOR JOISTS
AND RAFTERS - VISUAL GRADING

Species and Grade	Size	Normal Duration	Design Value in Bending "F _b "		Modulus of Elasticity "E"	Grading Rules Agency
			Snow Loading	7-Day Loading		
Select Structural		1380	1585	1725	1500000	
No.1		1000	1150	1250	1400000	
No.2	2"X8"	965	1110	1210	1300000	(See notes 1 and 2)
No.3		550	635	690	1200000	
Select Structural		1265	1455	1580	1500000	
No.1		915	1055	1145	1400000	
No. 2	2"X10"	885	1020	1105	1300000	
No.3		505	580	635	1200000	
Select Structural		1150	1325	1440	1500000	
No. 1		835	960	1040	1400000	
No.2	2"X12"	805	925	1005	1300000	
No.3		460	530	575	1200000	

1. When dimension lumber is used where moisture content will exceed 19% for an extended time period, F_b shall be multiplied by 0.85 if F_b exceeds 1150 psi, and E shall be multiplied by 0.9.

2. Following is a list of agencies certified by the American Lumber Standards Committee Board of Review (as of 1991) for inspection and grading of untreated lumber under the rules indicated.

Rules Writing Agencies

Rules for which grading is authorized

Northeastern Lumber Manufacturers Association
(NELMA)
272 Tuttle Road, P.O. Box 87A,
Cumberland Center, Maine 04021

NELMA, NLGA,
WCLIB, WWPA,
NLGA

Northern Softwood Lumber Bureau (NSLB)
272 Tuttle Road, P.O. Box 87A,
Cumberland Center, Maine 04021

WSLB, WCLIB,
WWPA, NLGA

Redwood Inspection Service (RIS)
405 Enfrente Drive, Suite 200,
Novato, California 94949

RIS, WCLIB<
WWPA

Southern Pine Inspection Bureau (SPIB)
4709 Scenic Highway,
Pensacola, Florida 32504

SPIB, NELMA,
WCLIB, WWPA,
NLGA

West Coast Lumber Inspection Bureau (WCLIB)
6980 SW Varnes Road, P.O. Box 23145
Portland, Oregon 97223

WCLIB, RIS,
WWPA, NLGA,
SPIB

Western Wood Products Association (WWPA)
522 S.W. 5th Avenue, Yeon Building, Portland, OR 97204

WWPA, WCLIB,
NLGA, RIS, SPIB

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National Lumber Grades Authority (NLGA)

260-1055 W. Hastings Street, Vancouver, B.C., Canada V6E 2E9

Non-Rules Writing Agencies

California Lumber Inspection Service	RIS, WCLIB, WWPA, NLGA, SPIB
Pacific Lumber Inspection Bureau, Inc.	RIS, WCLIB, WWPA, NLGA
Timber Products Inspection	RIS, SPIB, WCLIS, WWPA
Alberta Forest Products Association	WLGA
Canadian Lumbermen's Association	NLGA, NELMA
Cariboo Lumber Manufacturers Association	NLGA
Central Forest Products Association	NLGA
Council of Forest Industries of British Columbia	NLGA
Interior Lumber Manufacturers Association	NLGA
Macdonald Inspection	NLGAS
Maritime Lumber Bureau	NLGA, NELMA
Ontario Lumber Manufacturers Association	NLGA, NELMA
Pacific Lumber Inspection Bureau	NLGA
Quebec Lumber Manufacturers Association	NLGA, NELMA

Appendix F, pages 421-423. Revise section as follows (R146-93, R199-93):

Appendix F

SWIMMING POOLS, SPAS AND HOT TUBS

Section F-101 General

The provisions of this appendix shall control the design and construction of swimming pools, spas and hot tubs installed in or upon the lot of a one and two family dwelling.

Section F-102 Definitions

For the purposes of these requirements, the terms used shall be defined as follows and as set forth in Section R-118.

Above-ground/on-ground pool: See definition of swimming pool.

Barrier: A fence, a wall, a building wall or a combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool.

Hot tub: See definition of swimming pool.

In-ground pool: See definition of swimming pool.

Residential: That which is situated on the premises of a detached one-or-two-family dwelling or a one-family townhouse not more than three stories in height.

Spa, nonportable: See definition of a swimming pool.

Spa, portable: A nonpermanent structure intended for recreational bathing, in which all controls, water-heating and water-circulating equipment are an integral part of the product and which is cord-connected (not permanently electrically wired).

Swimming pool: Any structure intended for swimming or recreational bathing that contains water over 24 inches deep. This includes in-ground, above-ground and on-ground swimming pools, hot tubs and spas.

Swimming pool, indoor: A swimming pool which is totally contained within a structure and surrounded on all four sides by walls of said structure.

Swimming pool, outdoor: Any swimming pool which is not an indoor pool.

Section F-103 Swimming Pools

F-103.1 Inground pools: Inground pools shall be designed and constructed in conformance with NSPI-5 as listed in Section F-107.

F-103.2 Aboveground and onground pools: Aboveground and onground pools shall be designed and constructed in conformance with ANSI/NSPI-4 as listed in Section F-107.

Section F-104 Spas and Hot Tubs

F-104.1 Permanently installed spas and hot tubs: Permanently installed spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-3 as listed in Section F-107.

F-104.2 Portable spas and hot tubs: Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-6 as listed in F-107.

Section F-105 Barrier Requirements

F-105.1 Application: The provisions of this chapter shall control the design of barriers for residential swimming pools, spas and hot tubs. These design controls are intended to provide protection against potential drownings and near-drownings by restricting access to swimming pools, spas and hot tubs.

F-105.2 Outdoor swimming pool: An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be provided with a barrier which shall comply with the following:

1. The top of the barrier shall be at least 48 inches above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an above-ground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches.

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2. Openings in the barrier shall not allow passage of a 4-inch diameter sphere.
3. Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.
4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches, the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 1 3/4 inches in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1 3/4 inches in width.
5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches or more, spacing between vertical members shall not exceed 4 inches. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1 3/4 inches in width.
6. Maximum mesh size for chain link fences shall be a 1 1/4-inch square unless the fence is provided with slats fastened at the top or the bottom which reduce the openings to not more than 1 3/4 inches.
7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than 1 3/4 inches.
8. Access gates shall comply with the requirements of Section F103.1, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches from the bottom of the gate, the release mechanism and openings shall comply with the following:
 - a. The release mechanism shall be located on the pool side of the gate at least 3 inches below the top of the gate; and
 - b. The gate and barrier shall have no opening greater than 1/2 inch within 18 inches of the release mechanism.Where a wall of a dwelling serves as part of the barrier one of the following conditions shall be met:

9. Where a wall of a dwelling serves as part of the barrier one of the following conditions shall be met:
 - a. The pool shall be equipped with a powered safety cover in compliance with ASTM ES13-89; or
 - b. All doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible warning when the door and its screen, if present, are opened. The alarm shall sound continuously for a minimum of 30 seconds immediately after the door is opened and be capable of being heard throughout the house during normal household activities. The alarm shall automatically reset under all conditions. The alarm system shall be equipped with a manual means, such as touchpad or switch, to temporarily deactivate the alarm for a single opening. Such deactivation shall last for not more than 15 seconds. The deactivation switch(es) shall be located at least 54 inches above the threshold of the door; or
 - c. Other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body, shall be acceptable so long as the degree of protection afforded is not less than the protection afforded by (a) or (b) described above.
10. Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps, then:
 - a. The ladder or steps shall be capable of being secured, locked or removed to prevent access; or
 - b. The ladder or steps shall be surrounded by a barrier which meets the requirements of Section F- 103.1, Items 1 through 9. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch diameter sphere.

F-105.3 Indoor swimming pool: All walls surrounding an indoor swimming pool shall comply with Section F-105.2, Item 9.

F-105.4 Prohibited locations: Barriers shall be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers.

F-105.5 Barrier exceptions: A portable spa with a safety cover which complies with ASTM ES13, as listed in F-107, shall be exempt from the provisions of this appendix. Swimming pools, hot tubs, and nonportable spas with safety covers shall not be exempt from the provisions of this appendix.

Section F-106 ABBREVIATIONS

ANSI—	American National Standards Institute 11 West 42nd Street New York, NY 10036
ASTM—	American Society for Testing and Materials 1916 Race Street, Philadelphia, PA 19103
NSPI—	National Spa and Pool Institute 2111 Eisenhower Avenue, Alexandria, VA 22314

Section F-107 STANDARDS

ANSI/NSPI

ANSI/NSPI-3-1992	Standard for Permanently Installed Residential Spas F-104.1
ANSI/NSPI-4-1992	Standard for Aboveground/Onground Residential Swimming Pools F-103.2
ANSI/NSPI-6-1992	Standard for Residential Portable Spas ...F-104.2

ASTM

ASTM E13-89	Emergency Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs F-105.5
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NSPI

NSPI-5-1987	Standard for Residential Swimming Pools F-103.1
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Appendix G, page 424. Add new section to read as follows (R214-92):

Appendix G

ENERGY CONSERVATION

Energy Conservation shall be based on the 1992 edition of the CABO Model Energy Code. These provisions shall apply to all site built and prefabricated housing units, with the exception of manufactured (mobile) homes.

Pages 296-301, Section S-26.2001: Add Table references to Standards listed as shown.

SECTION S-26.2001—PLUMBING STANDARDS GENERAL
(As Listed in Table P-2001.1)

ANSI

A112.1.2—1942	Air Gaps in Plumbing	Table P-2001.1
B16.12—1983	Cast Iron Threaded Drainage Fittings	Table P-2001.1

1993/1994 Amendments

B 16.22—1989	Wrought Copper and Copper-Alloy Solder Joint Pressure Fittings	Table P-2001.1
B16.26—1988	Cast Copper-Alloy Fittings for Flared Copper Tubes	Table P-2001.1
Z21.10.1—1987	Storage Water Heaters with Input Ratings of 75,000 Btu per Hour or Less, Gas Water Heaters, Volume I with Addenda Z21.10.1a—1988	Table P-2001.1
Z21.10.3—1987	Gas Water Heaters, Volume III, Circulating and Storage, with Input Ratings above 75,000 Btu per Hour, with Addenda Z21.10.3a—1988	Table P-2001.1
Z21.12—1981	Draft Hoods, with Addenda Z21.12a—1983	Table P-2001.1
Z21.13—1987	Gas-Fired Low-Pressure Steam and Hot Water Boilers	Table P-2001.1
Z21.22—1986	Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems	Table P-2001.1
Z21.24—1987	Metal Connectors for Gas Appliances	Table P-2001.1
Z21.41—1989	Quick-Disconnect Devices for Use with Gas Fuel	Table P-2001.1
Z21.45—1985	Flexible Connectors of Other Than All-Metal Construction for Gas Appliances with Addenda Z21.45a—1987	Table P-2001.1
Z124.1—1987	Plastic Bathtub Units	Tables P-2001.1, P-2301
Z124.2—1987	Plastic Shower Receptors and Shower Stalls	Tables P-2001.1, P-2301
Z124.3—1986	Plastic Lavatories	Tables P-2001.1, P-2301
Z124.4—1986	Plastic Water Closet Bowls and Tanks	Tables P-2001.1, P-2301
Z124.6—1990	Plastic Sinks	Tables P-2001.1, P-2301

ANSI/NSF

14—1990	Plastic Piping Components and Related Materials	Table P-2001.1
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ASME

A112.18.1M—1989	Plumbing Fixture Fittings	Table P-2001.1
B 16.18—1984	Cast Copper Alloy Solder Joist Pressure Fittings	Tables P-2001.1, P-2403.1
B16.23—1984	Cast Copper Alloy Solder-Joint Drainage Fittings	Tables P-2001.1, P-2202.1

ASME/ANSI

A112.19.1M—1987	Enameled Cast Iron Plumbing Fixtures	Tables P-2001.1, P-2301
A112.19.2M—1990	Vitreous China Plumbing Fixtures	Tables P-2001.1, P-2301
A112.19.3M—1987	Stainless Steel Plumbing Fixtures (Designed for Residential Use)	Tables P-2001.1, P-2301
A112.19.4M—1984	Porcelain Enameled Formed Steel Plumbing Fixtures	Tables P-2001.1, P-2301
A112.19.5—1979	Trim for Water Closet Bowls, Tanks and Urinals	Tables P-2001.1, P-2301
A112.19.6	Hydraulic Performance Water Closets and Urinals	Tables P-2001.1, P-2301
A112.19.7M—1987	Whirlpool Bathtub Appliances	Tables P-2001.1, P-2301
A112.19.8M—1987	Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs and Whirlpool Bathtub Appliances	Table P-2001.1, P-2301

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A1 12.21.1M —1980	Floor Drains	Table P-2001.1, P-2301
B16.3—1985	Malleable Iron Threaded Fittings, Classes 150 and 300	Table P-2001.1
B16.4—1985	Cast Iron Threaded Fittings, Classes 125 and 250	Table P-2001.1
B16.15—1985	Cast Bronze Threaded Fittings, Classes 125 and 250	Table P-2001.1
B16.29—1986	Wrought Copper and Wrought Copper-Alloy Solder Joint Drainage Fittings, DWV	Table P-2001.1

ASSE/ANSI

1001—1988	Pipe Applied Vacuum Breakers	Tables P-2001.1, P-2301
1002—1979 (1986)	Water Closet Flush Tank Ball Cocks	Tables P-2001.1, P-2301
1003—1981	Water Pressure Reducing Valves for Domestic Water Supply Systems	Tables P-2001.1, P-2301
1006—1986	Household Dishwashing Machines	Tables P-2001.1, P-2301
1007—1973 (1986)	Home Laundry Equipment	Tables P-2001.1, P-2301
1008—1973 (1986)	Household Disposers	Tables P-2001.1, P-2301
1010—1982	Water Hammer Arrestors	Tables P-2001.1, P-2301
1011—1982	Hose Connection Vacuum Breakers	Tables P-2001.1, P-2301
1014—1979	Handheld Showers	Tables P-2001.1, P-2301
1016—1979	Individual Shower Control Valves, Anti-Scald	Tables P-2001.1, P-2301
1019—1978	Wall Hydrants, Freezeless, Automatic Draining, Anti-Backflow Types	Tables P-2001.1, P-2301
1023—1979	Plumbing Requirements for Hot Water Dispensers, Household Storage Type, Electrical	Tables P-2001.1, P-2301
1025—1978	Diverter for Plumbing Faucets with Hose Spray, Anti-Siphon Type, Residential Application	Tables P-2001.1, P-2301
1037—1986	Pressurized Flushing Devices for Plumbing Fixtures	Tables P-2001.1, P-2301

ASTM

A53—1988a	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless	Tables P-2001.1, P-2202.1, P-2403.1
A74—1987	Specification for Cast Iron Soil Pipe and Fittings	Tables P-2001.1, P-2202.1, P-2202.2
A126—1984	Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings	Tables P-2001.1, P-2202.1
A197—1987	Specification for Cupola Malleable Iron	Tables P-2001.1, P-2202.1
A377—1984	Specification for Ductile Iron Pressure Pipe	Tables P-2001.1, P-2403.1
A525—1987	Specification for General Requirements for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process	Tables P-2001.1
B32—1989	Specification for Solder Metal	Tables P-2001.1
B42—1989	Specification for Seamless Copper Pipe, Standard Size	Tables P-2001.1, P-2202.1
B43—1988	Specification for Seamless Red Brass Pipe, Standard Sizes	Tables P-2001.1, P-2202.1, P-2403.1
B75—1986	Specification for Seamless Copper Tube	Tables P-2001.1, P-2202.1, P-2202.2, P-2403.1
B88—1988a	Specification for Seamless Copper Water Tube	Tables P-2001.1, P-2202.1, P-2202.2, P-2403.1
B135—1986a	Specification for Seamless Brass Tube	Tables P-2001.1, P-2403.1
B152—1988	Specification for Copper Sheet, Strip, Plate and Rolled Bar	Table P-2001.1

1993/1994 Amendments

B306—1988	Specification for Copper Drainage Tube	Tables P-2001.1, P-2202.1, P-2202.2
B447—1989	Welded Copper Water Tube (WK, WL, WM)	Tables P-2001.1, P-2403.1
C14—1988	Specification for Concrete Sewer, Storm Drain, and Culvert Pipe	Tables P-2001.1, P-2202.2
C425—1988	Specification for Compression Joints for Vitrified Clay Pipe and Fittings	Tables P-2001.1, P-2202.2
C564—1988	Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings (Reapproved 1982)	Tables P-2001.1
C700—1988	Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength and Perforated	Tables P-2001.1, P-2202.2
D1527—1989	Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedule 40 and 80 (Reapproved 1982)	Tables P-2001.1, P-2403.1
D1785—1989	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120	Tables P-2001.1, P-2403.1
D1861—1988	Specification for Homogeneous Bituminized Fiber Drain and Sewer Pipe (Reapproved 1981)	Tables P-2001.1, P-2202.2
D2104—1989	Specification for Polyethylene (PE) Plastic Pipe, Schedule 40	Tables P-2001.1, P-2403.1
D2235—1988	Specification for Solvent Cement Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings	Table P-2001.1
D2239—1989	Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter	Tables P-2001.1, P-2403.1
D2241—1989	Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR-Series)	Tables P-2001.1, P-2403.1
D2282—1989	Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (SDR-PR)	Tables P-2001.1, P-2403.1
D2321—1983a	Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe	Tables P-2001.1, P-2202.2
D2447—1988	Specification for Polyethylene (PE) Plastic Pipe, Schedules 40 and 80 Based on Outside Diameter	Tables P-2001.1, P-2403.1
D2466—1989	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	Tables P-2001.1, P-2403.1
D2467—1989	Specification for Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	Table P-2001.1, Table P-2403.1
D2468—1989	Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe Fittings, Schedule 40	Table P-2001.1
D2564—1988	Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings	Table P-2001.1
D2609—1989	Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe	Tables P-2001.1, P-2403.1
D2661—1987a	Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Drain, Waste, and Vent Pipe and Fittings	Tables P-2001.1, P-2202.1, P-2202.2
D2662—1989	Specification for Polybutylene (PB) Plastic Pipe (SDR-PR)	Tables P-2001.1, P-2403.1
D2665—1989a	Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	Tables P-2001.1, P-2202.1, P-2202.2

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D2666—1989	Specification for Polybutylene (PB) Plastic Tubing	Tables P-2001.1, P-2403.1
D2672—1989	Specification for Bell-End Poly (Vinyl Chloride) (PVC) Pipe	Table P-2001.1
D2737—1989	Specification for Polyethylene (PE) Plastic Tubing	Tables P-2001.1, P-2403.1
D2751—1983a	Specifications for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings	Tables P-2001.1, P-2202.1, P-2202.2
D2846 1989	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems	Tables P-2001.1, P-2403.1
D2949—1989	Specification for 3.25-in. Outside Diameter Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	Tables P-2001.1, P-2202.1, P-2202.2
D3000—1989	Standard Specification for Polybutylene (PB) Plastic Pipe (SDR-PR) Based on Outside Diameter	Tables P-2001.1, P-2403.1
D3034—1989	Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings	Tables P-2001.1, P-2202.2
D3122—1980	Specification for Solvent Cements for Styrene Rubber (SR) Plastic Pipe and Fittings (Reapproved 1985)	Table P-2001.1
D3212—1989	Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals	Tables P-2001.1, P-2202.2
D3261—1988a	Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	Tables P-2001.1, P-2403.1
D3309—1989a	Specification for Polybutylene (PB) Plastic Hot-Water Distribution Systems	Tables P-2001.1, P-2403.1
F402—1988	Standard Proctive for Safe Handling of Solvent Cements, Primers and Cleaners Used for Joining Thermoplastic Pipe and Fittings	Table P-2001.1
F409—1988	Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings	Tables P-2001.1, P-2202.1, P-2301
F438—1989a	Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40	Tables P-2001.1, P-2403.1
F439—1989	Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Fittings, Schedule 80	Tables P-2001.1, P-2403.1
F441—1989	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80	Tables P-2001.1, P-2403.1
F442—1989	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)	Tables P-2001.1, P-2403.1
F493—1988	Standard Specification for Solvent Cements for Chlorinated Poly (Vinyl) (CPVC) Plastic Pipe and Fittings	Table P-2001.1
F628—1988	Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core	Tables P-2001.1, P-2202.1, P-2202.2
F656—1988	Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings	Table P-2001.1

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F845—1988	Specification for Plastic Insert Fittings for Polybutylene (PB) Tubing	Tables P-2001.1, P-2403.1
F891—1988a	Specification for Coextruded Poly (Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core	Tables P-2001.1, P-2202.1, P-2202.2
CISPI		
HS74—1986	Specification for Cast Iron Soil Pipe and Fittings for Hub and Spigot Systems for Drain Waste or Vent, Sewer, Rainwater or Storm Drain Systems	Tables P-2001.1, P-2202.1, P-2202.2
HSN—1985	Specification for Neoprene Rubber Gaskets for Hub and Spigot Cast Iron Soil Pipe and Fittings	Table P-2001.1,
301—1985	Specification for Cast Iron Soil Pipe and Fittings for Hubless Cast Iron Sanitary System	Tables P-2001.1, P-2202.1, P-2202.2
CSA		
B602M—1990	Mechanical Couplings for Drain, Waste and Vent Pipe and Sewer Pipe	Tables P-2001.1, P-2202.1, P-2202.2
FS		
QQ-L-201f-2—1965 (1970)	Sheet Lead	Table P-2001.1
UL		
174—1983	Household Electric Storage Tank Water Heaters (Revised, March 1988)	Table P-2001.1
441—1986	Gas Vents	Table P-2001.1
726—1975	Oil-Fired Boiler Assemblies (Revised, March 1989)	Table P-2001.1
732—1988	Oil-Fired Storage Tank Water Heaters	Table P-2001.1